THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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In Depth
On-line in a Unix environment
ID/7

In Depth
Can the software vendor deliver training? **ID/13**

Mainframes
CW's annual Hardware Roundup/**23**

IBM unveils high-end micro, local net

By Eric Bender
CW Staff

BOCA RATON, Fla. — IBM's personal computer juggernaut picked up speed last week as the company launched a high-end desktop system, a broadband local-area network for micros and a host of related products. These included:

- Enhancements to the IBM 3270 Personal Computer, including the ability to attach the IBM Personal Computer Expansion Unit (see story page 4).
- A program, priced at $149, that provides a multitasking windowing environment for PC-DOS packages (see story page 4).

Industry analysts, who generally applauded the introductions, found IBM's powerful new Personal Computer AT particularly impressive. "IBM now can claim to be the price/performance leader in the microcomputer field," commented George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

The Personal Computer AT, built around an Intel Corp. 80286 chip, offers system performance two to three times faster than the basic Personal Computer and is said to be compatible with most existing software and hardware products.

The next-generation system also offers random-access memory expandable to 3M bytes, hard disk storage up to 40M bytes, a new 1.2M-byte 5¼-in. diskette drive and eight expansion slots.

The Personal Computer AT is available immediately, according to IBM:

It is designed to support stand-alone, multiuser or network operations. Prices start at $3,995 for a version with 256K bytes of RAM and a single high-capacity floppy disk drive. A model with 512K bytes of RAM, one high-capacity floppy disk drive and a 20M-byte hard disk drive costs $5,795.

IBM's newest micro features an 84-key keyboard (slightly modified from the Personal Computer's design), a real-time system clock/calendar with battery backup and a socket for an Intel 80287 mathematical coprocessor, which is offered for $375.

The 1.2M-byte high-capacity diskette drives can reportedly read standard IBM

See IBM page 4

TOP OF THE NEWS

Take your pick. The U.S. Justice Department unveiled a computer crime bill and criticized a similar bill approved by the House of Representatives. **Page 2.**

■

Think small and save big is the message Oracle Corp. sent when it announced a micro version of its Oracle data base management system. **Page 6.**

■

Low-end products were in the limelight when Tandem Computers, Inc. reconfigured several systems and cut their prices. **Page 6.**

■

The possibility of illegal technology transfer has put a British computer manufacturer under close scrutiny from customs agents on both sides of the Atlantic. **Page 9.**

■

All aboard. Riding on the railroad has seemed risky lately. But the railroad industry is boasting that its computer and communications systems have improved. **Page 10.**

■

Breaking with a strong tradition of strictly in-house testing, Amdahl Corp. opted for beta testing its Model 5870 mainframe at a user site. The bugs so far have been few at Dallas-based Chilton Corp., a credit reporting firm that was the recipient of the first 5870 from Amdahl's production line. **Page 77.**

■

First Amendment: Does it protect on-line data bases?

By Edward Warner
CW Staff

WASHINGTON, D.C. — Does the First Amendment protect the publisher of an on-line data base in the same way it protects a periodical publisher or broadcaster?

That question could receive an answer in a little-known libel case to be heard in early October by the U.S. Supreme Court. The case could have wide-ranging implications for any firm that gathers and shares economic information, from credit reporting services to electronic publishers and financial data services, according to the Information Industry Asso-

See LIBEL page 8

PRODUCT SPOTLIGHT

Computer-aided software engineering: Automating DP

By Paul Gillin
CW Staff

One of the great ironies of data processing is that it has contributed so much to automating business functions and done so little to automate itself.

In many DP shops, requirements analysis and system design are still carried out using voluminous typewritten documents and hand-drawn diagrams, while programming is done on coding sheets. Furthermore, the procedure for checking software projects against requirements is a laborious manual task that is prone to error and oversight.

So-called fourth-generation programming technologies have successfully worked their way into the DP environment in recent years. But even they are geared toward the coding process, which makes up only a fraction of the system development life cycle. Experts concede that little has been done to automate the job of systems design, that complex road map programmers follow to write software.

Advanced programming technology in use

However, that gap is now quickly being filled. The last two years have seen some dramatic activity in the flowering field of computer-aided software engineering. The growth of this new area has gone largely unnoticed, probably due to the fact that most major vendors have not yet elected to participate. But many software productivity experts believe these automated technologies are poised for explosive growth, the kind that will make them as common in large programming environments as spreadsheets are in the user community.

Computer-aided software engineering is still poorly defined. Generally, the available technologies provide various levels of computer assistance in most or all areas of the development life cycle, at levels including requirements definition, systems design, coding, testing, documentation and maintenance.

A user, for example, may be able to draw a flowchart using graphics utilities, write code that corresponds to different pieces of the flowchart, compile

See DESIGN page 15

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NEWSPAPER

Justice Department proposes computer crime bill

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Justice Department recently unveiled its long-awaited computer crime bill and at the same time criticized the computer crime bill already approved by the U.S. House of Representatives in late July.

At a recent House subcommittee hearing, the Justice Department proposed the Federal Computer Systems Protection Act of 1984, which would make it a federal felony to engage in computer-related fraud or theft or to damage or destroy computer hardware, software or stored data, when the offense involves computers used by the federal government, federally insured financial institutions or the interstate or foreign use of computers.

In addition, the proposal would establish a federal misdemeanor for any unauthorized access to computers used by the federal government or federally insured financial institutions.

Penalties under the Justice Department proposal would extend to five years in prison and a $50,000 fine for the felony and up to one year in prison and a $25,000 fine for the misdemeanor. Moreover, prosecutors could also ask the judge to require the offender to forfeit the computer used in the crime.

This forfeiture provision, according to John C. Keeney, deputy assistant attorney general, is a key feature of the Justice Department's bill. "We can take away their toy, and that could be a substantial deterrent," Keeney told the subcommittee, especially in cases where judges are reluctant to prescribe stiff prison terms and fines for adolescent hackers.

Keeney said the administration bill is "a distinct improvement" over the computer crime provisions of the House-passed bill (H.R. 5616), sponsored by Rep. William J. Hughes (D-N.J.). Generally, Keeney said, the administration bill is better drafted, simpler, easier to enforce and does not intrude on state authority.

It is not yet clear what effect, if any, the emergence of the Justice Department bill will have on the prospects of the House bill.

In the next few weeks, key House legislators hope to convince the Senate, in informal negotiations, to accept the House computer crime provisions as amendments to credit card fraud legislation [CW, July 30].

Keeney asserted that the Justice Department bill is superior because it does not set a $5,000 financial ceiling on federal prosecution as does the House bill, it covers actual destruction of computer property and it contains the forfeiture penalty.

Another major difference is that the Justice Department bill does not cover unauthorised access to most business computers, instead leaving such trespass crimes for states to prosecute.

The House bill, on the other hand, establishes a misdemeanor for unauthorized access to any computer containing financial data protected by federal privacy laws.

Keeney apologised to the Congress for the long delay in submitting the proposal, acknowledging that drafters of the House bill could not obtain the department's views before acting on their bill.

The Justice Department proposal surfaced at a hearing held Aug. 9 by the House Judiciary Committee's Subcommittee on Civil and Constitutional Rights. The subcommittee hearing actually dealt with a separate bill, the Medical Computer Crimes Act of 1984 (H.R. 5831), sponsored by Rep. Ron Wyden (D-Ore.).

Wyden's bill, which establishes as a federal crime the use of a telecommunications device to tamper with computerized medical records, was approved by the House Energy and Commerce Committee on June 27, but it also must gain the approval of the House Judiciary Committee.

The Justice Department formally opposed the Wyden bill on the grounds that it is too narrow in scope and said the comprehensive approach taken by the administration bill is preferable to enacting a series of special-interest laws.

Wyden strongly disagreed, maintaining that medical records are unique and should be inviolate, since data tampering could cause the death of hospital patients.

"I believe we can take incremental approaches to solving the problem," he testified, because comprehensive legislation will be "a long time coming."

Four charged with $250,000 technology theft

By James Connolly
CW Staff

LOS ANGELES — One man has pleaded guilty and three others are awaiting trial here on charges that they used stolen computer technology to build a computer service business competing with the victim firm.

The four men allegedly set up Western States Marketing Service in Oxnard, Calif., to compete with Oakleaf Computer Corp. of Chatsworth, Calif., a firm that markets and services microcomputers used by automobile dealers to prepare sales contracts.

The scheme allegedly involved the theft of $250,000 worth of erasable programmable read-only memory (Eprom) devices from Oakleaf and use of those Eproms at Western States Marketing Service to update and reprogram the auto dealers' systems.

One of the accused, Shawn R. Kauffman, a former computer technician at Oakleaf, pleaded guilty last month to a charge of receiving stolen goods. He is scheduled to be sentenced today in municipal court here. According to Los Angeles County Deputy District Attorney Kim Wildman, Kauffman cooperated with investigators.

The three remaining defendants, former Oakleaf shipping clerk Maurice Green, former Oakleaf computer technician Robert M. Morgan and Marion F. Branson, are scheduled for Aug. 23 preliminary hearings in municipal court. Green is charged with grand theft and accepting a bribe, while the others are charged with grand theft of trade secrets, receiving stolen property and offering a bribe.

According to an investigative report, Kauffman and Morgan left their jobs in 1982, taking with them Oakleaf's master computer program, which was designed to reprogram auto dealers' computers to allow for changes in dealer costs, interest rates and other factors. Kauffman, Morgan and Branson, who once worked for an Oakleaf client, then established Western States Marketing Service and siphoned off $40,000 per month from Oakleaf's market, according to Oakleaf officials.

Green allegedly provided the trio with Eproms and other supplies stolen from Oakleaf.

[redacted]

NEWS SUMMARY

IBM has launched a high-end desktop system, a broadband local-area network and a host of related products/4

Tandem Computers, Inc. has repriced and reconfigured its low-end and mid-range packaged systems in a bid to stimulate sales/6

Oracle Corp. has unveiled a full-scale implementation of its Oracle relational data base management system for four microcomputers/8

Systime, Inc., a British firm that is 41% owned by Control Data Corp., was searched by U.S. and UK customs agents looking for evidence of illegal diversion of licensed computer products to Warsaw Pact countries/9

Despite bad publicity in the wake of recent train accidents, the railroad industry is expanding and enhancing its computer systems to improve operations/10

AT&T last week released figures showing an unexpectedly high level of usage for their Electronic Messaging System at the Los Angeles Summer Olympics/12

State lotteries have flourished in the past year and would be growing faster, except for the confusion generated by the AT&T divestiture/13

Product Spotlight: Automated design tools/16-18

CW's annual Hardware Roundup looks at 185 systems from 32 vendors/23-40

The U.S. Postal Service has decided to use the military's high-level programming language, Ada, in two new mail-handling centers/43

Only half of America's largest corporations have a crisis communications plan, according to a study of the top 1,000 industrial and top 500 service companies identified by *Fortune* magazine/44

Mobil Oil Corp. has installed an on-line transaction processing system designed to capture and send credit card purchase information electronically/50

Blue Cross and Blue Shield of Mississippi has increased productivity with an on-line claims administration system/52

Microcomputers have helped American Express Co.'s corporate Human Resource Services department reduce costs/54

Telecom Briefs/14
International Report/29
Washington Update/45
Calender/56

IN DEPTH
Unix environment/ID/7
Software vendor/ID/13
Information systems/ID/17

EDITORIAL/58
SOFTWARE & SERVICES/61
COMMUNICATIONS/68
SYSTEMS & PERIPHERALS/77
MICROCOMPUTERS/87
COMPUTER INDUSTRY/99

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IBM from page 1

180K-byte or 360K-byte diskettes, but cannot write in that format, so diskettes written by the high-capacity drives cannot be read by standard Personal Computers. IBM will offer a 360K-byte drive for the Personal Computer AT as a $425 option.

The Personal Computer AT runs as a single-user, single-tasking machine under a new release of IBM's PC-DOS operating system created for the Personal Computer AT. PC-DOS Version 3.0., written by Microsoft Corp., is available now for $65. The software is upward-compatible with PC-DOS 2.1, which IBM will continue to offer for its other Personal Computers.

PC-DOS can directly address only 640K bytes of internal memory, and Version 3.0 treats surplus RAM as a virtual disk. The system software also supports the new disk drives, gives networking support and offers many other enhancements, the company said. IBM intends to replace Version 3.0 in first-quarter 1985 with Version 3.1, which will offer upgraded networking support and sell for $65, or as a $30 upgrade.

Alternatively, the Personal Computer AT is said to support up to three users under IBM Personal Computer Xenix, a multiuser operating system also developed by Microsoft. Personal Computer Xenix, scheduled for delivery in first-quarter 1985, is priced at $395. The Personal Computer Xenix Software Development System, available in the same time frame, will cost $455.

Finally, the system can act as a file server for the IBM PC Network.

Network

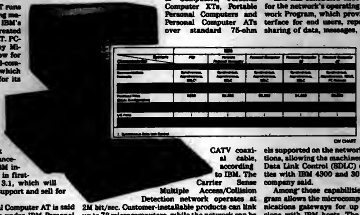
IBM's new broadband network connects Personal Computers, Personal Computer XTs, Portable Personal Computers and Personal Computer ATs over standard 75-ohm CATV coaxial cable, according to IBM. The Carrier Sense Multiple Access/Collision Detection network operates at 2M bit/sec. Customer-installable products can link up to 72 microcomputers, while the network can be expanded to support up to 1,000 systems, the company said. Personal Computer XTs can also act as file servers, according to IBM.

Network hardware, available in October, includes the PC Network Adapter, a card that plugs into an expansion slot, for $695; a stand-alone Network Translator Unit, required for net operation, which directly connects up to eight Personal Computers, for $595; a Network Base Expander that expands the net beyond eight stations or 200 ft, for $59; and cabling equipment.

IBM has scheduled first-quarter 1985 delivery for the network's operating software. The PC Network Program, which provides a menu-driven interface for end users, reportedly will allow the sharing of data, messages, printers and other devices on the network. It is priced at $75.

The company also intends to offer the IBM PC Network Systems Network Architecture 3270 Emulation Program, priced at $375, when available sometime in the first half of 1985. The software will provide the four Personal Computer models supported on the network with some 3270 functions, allowing tha machines to share Synchronous Data Link Control (SDLC) communications facilities with IBM 4300 and 30 series processors, the company said.

Among those capabilities, the emulation program allows the microcomputers to act as communications gateways for up to 32 concurrent sessions with IBM hosts. The software also gives a stand-alone Personal Computer 3270 emulation features when the system is operating as a remote user station attached to an IBM 4300 or 30 series system via an SDLC communications line.



	IBM				
Systems / Characteristics	PCjr	Portable Personal Computer	Personal Computer	Personal Computer XT	Personal Computer AT
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Communications Protocols	Synchronous, Asynchronous, SDLC¹	Synchronous, Asynchronous, SDLC	Synchronous, Asynchronous, SDLC	Synchronous, Asynchronous, SDLC	Synchronous, Asynchronous, SDLC, PC Network
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price (Basic Configuration)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
I/O Ports	1	1	1	1	1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. Synchronous Data Link Control

CW CHART

High-level language interface, link to Expansion Unit out for 3270-PC

RYE BROOK, N.Y. — In conjunction with introductions from IBM's Entry Systems Division last week, the IBM Information Systems Group here announced enhancements for the IBM 3270 Personal Computer, which include the ability to attach the IBM Personal Computer Expansion Unit — with its eight additional user option slots and 10M-byte hard disk drive — and the capability to communicate with host computers through the IBM 3276 control unit.

Enhanced printing abilities

IBM also announced Release 1.2 of the 3270 Personal Computer control program, which offers enhanced printing abilities. The program allows 3270-PCs to attach to the IBM 5218 letter-quality printer or to the 3852 ink-jet printer. Slated for September delivery, the program has a one-time charge of $300. One copy will be shipped free to customers who have installed 3270-PC programs, the company said.

In addition, IBM introduced a high-level language application interface program, available in fourth-quarter 1984, for $130. The program is said to permit the creation of Personal Computer applications using IBM Cobol, Basic and Pascal for exchanging data between host computer and Personal Computer sessions.

More information is available from IBM's Information Systems Group, located at 900 King St., Rye Brook, N.Y. 10573.

IBM unveils 'Topview' program for PC-DOS multitasking windows

BOCA RATON, Fla. — Among other highlights of last week's introductions, IBM unveiled a $149 program that provides a multitasking windowing environment for PC-DOS packages. The internally developed Topview program is "a key foundation for future applications," said Philip Estridge, IBM vice-president and president of the Entry Systems Division.

Allowing users to transfer data between multiple PC-DOS programs running concurrently, Topview will operate on IBM's Personal Computer, Personal Computer XT, Portable Personal Computer, Personal Computer AT and 3270 Personal Computer. The program will be sold in first-quarter 1985.

Most existing PC-DOS applications will run in the Topview environment, according to IBM. The vendor listed two dozen of its own software offerings supported by Topview, but said it has no plans to test packages from outside vendors. "In general, the user can take advantage of a subset of Topview facilities when running existing applications," IBM said. A Topview Programmer's Toolkit will be sold in first-quarter 1985 for $395.

IBM again emphasized its continuing commitment to an open-architecture policy for its micro line.

IBM Entry Systems Division can be reached through P. O. Box 1328, Boca Raton, Fla. 33432.

Analysts' Rx for AT rivals: aspirin

By Paul Korzeniowski
CW Staff

While industry observers viewed the IBM Personal Computer AT as a leading-edge product, they predicted that it will create restless days and nights for MIS managers, IBM Personal Computer-compatible manufacturers, multiuser microcomputer manufacturers and even IBM itself.

"The [Personal Computer AT] represents a next-generation product," said Gene Maimin, project manager for microcomputer support at Columbia Pictures Industries, Inc. "It is not merely an [IBM Portable Personal Computer] or a [PCjr]. Its most significant feature is the price. IBM could have priced the product at $10,000 and not lost a sale."

As a next-generation product, the Personal Computer AT may usher in the next generation of headaches for MIS managers, according to one analyst. "The [Personal Computer AT] introduction demonstrates that IBM's Entry Systems Division still holds significant power within IBM," noted George Colony, president of Forrester Research, Inc., a consulting firm in Cambridge, Mass.

"Consequentially, there are conflicts within IBM's product line — the Personal Computer AT competes with the IBM Personal Computer and

See ANALYSTS page 5

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IBM's first net well received; analysts call for more

By Eric Bender
CW Staff

IBM has answered the call for a fully featured local-area network that directly links personal computers and their peripherals, and the early response to the IBM PC Network has been generally favorable.

IBM's announcement will change attitudes in the end-user community, which has hesitated to adopt local-area networks, predicted Everett Meserve of Arthur D. Little, Inc. in Cambridge, Mass. "IBM has signaled the user that it's now OK to do it. The power of IBM will come through."

The network equipment is priced very aggressively; the broadband design will handle future services, such as video; and IBM has emphasized ease of installation and operation, other industry analysts said.

But some noted that initially the PC Network will give only limited hooks into Systems Network Architecture/Synchronous Data Link Control environments. And they pointed out that any grand scheme tying together IBM's smorgasbord of networks has not emerged.

The IBM PC Network "is not compatible with the IBM cabling plan at present," said Jim Renalds of Dataquest, Inc. "The PC Network is no more than a short-term fix right now. When the [planned token-ring network] emerges, the PC Network will merge with it or be outmoded by it."

George Colony of Forrester Research, Inc. in Cambridge, Mass., predicted that the PC Network "will confuse the user.

"The real solution is the cabling system that won't be available for two more years," Colony said. "The [PC Network] attaches only personal computers. A corporation needs a network to tie all the machines together."

Others voiced disappointment that IBM did not promote the possibilities for application software working on the net. "It's basically a hardware announcement," commented Chris Christiansen of the Yankee Group in Boston. "IBM won't talk about applications running across a net."

"I'm very enthusiastic about the announcement," 3Com Corp. President William Krause said. "It really signals the next era in distributed computing."

But he noted that the IBM net will not be available for at least five months and called it an interim solution, hinted at price cuts for 3Com's Etherseries and downplayed the importance of the broadband configuration.

"All broadband really does is save you wiring," Krause claimed. "What people really want is to integrate voice and data into the same band, not put voice on one band and data on the other band."

"I predict a fivefold increase in personal computer network installations in the next year," said Joseph Hughes, marketing vice-president at Corvus Systems, Inc., which claims more installations of local personal computer networks than any other vendor.

"We can afford to have a smaller percentage of that market." He added that he expects the Corvus Omninet to coexist with the IBM net, saying that Corvus plans to supply a gateway between the nets early next year.

ANALYSTS from page 4

IBM's System/36; the PC Network is available, yet IBM's cabling system won't be unveiled for at least two years. IBM's long-term corporate strategy is not well-defined and is creating chaos for its users," he said.

In addition to causing MIS managers consternation, the Personal Computer AT poses significant challenges to IBM Personal Computer-compatible manufacturers.

"IBM is daring compatible manufacturers to keep pace with it. IBM is reenacting in the microcomputer world what it has done for years in the mainframe world," according to Harry Edelsen, vice-president of research at First Boston, Inc. The challenge lies in the Personal Computer AT's use of Intel Corp.'s 80286.

Multiuser microcomputer manufacturers may also feel Big Blue's heat, but they may be better able to weather it than compatible manufacturers, said Jim Renalds, industry analyst at Dataquest, Inc. "The delay in delivering Xenix and the network [both scheduled for first-quarter 1985] will give vendors enough time to respond to IBM."

Colony stated that he was surprised that the Personal Computer AT only supports three users. "Three users is not where the technology is heading," Colony said. "There are a number of systems available which support eight to 10 users."

The Personal Computer AT's greatest impact may be on units of IBM's own product line — the IBM Personal Computer and Personal Computer XT. "The [Personal Computer] and [Personal Computer XT] are dead in the water," Colony predicted. "In the next six months, there will be another price cut on those machines. In 12 months, there will be price cuts on the [Personal Computer AT]. IBM will round out its product line by replacing the current family of IBM Personal Computers with Personal Computer ATs."

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Oracle unveils micro version of relational DBMS

By Paul Gillin
CW Staff

MENLO PARK, Calif. — Capping a two-year effort that involved writing many of its own migration utilities, Oracle Corp. today unveiled a full-scale implementation of its Oracle relational data base management system (DBMS) for four popular microcomputers.

The new version of Oracle runs on the IBM Personal Computer XT, the newly announced IBM Personal Computer AT, the Texas Instruments, Inc. Professional microcomputer and the Digital Equipment Corp. Rainbow, each with 512K bytes of memory.

The new product also includes Oracle Link, a built-in micro-mainframe communications feature that reportedly allows queries and updates to be originated and executed interchangeably on the micro or mainframe. The feature can be used to link Oracle on any of the four micros to a version of Oracle running on an IBM mainframe or DEC VAX-11

Oracle President Larry Ellison said the $1,000 personal computer implementation of Oracle is a functional duplicate of the $96,000 mainframe version. "If the users had the source code, they would be 98% of the way to running [the micro version] under [IBM's] MVS," he said. "Every single function, every call, every program that runs on mainframe Oracle or [IBM's] DB 2 is capable of running on the [micro version].".

The main differences between the micro and mainframe versions are that the micro version supports only one user and is limited by a smaller disk capacity, Ellison said. He added that some functions that cannot be performed on the targeted micros, such as multiprocessing, have also been left out. But Ellison said that the company has successfully moved large system applications to the micro version of Oracle.

Ellison said he expects Oracle to compete against the established micro DBMS vendors. He called the new product the first complete implementation of IBM's SQL query language on the four micros. In addition to SQL, Oracle includes a report writer, data dictionary, application generator, screen manager, document preparation system and Oracle Link.

Because Oracle consumes over 1M byte of memory on the mainframe, the Oracle development staff had to write a range of special systems and utilities software to accomplish the port to the micros, Ellison said.

According to Ellison, many of the facilities that are needed to accommodate the new products are contained in the recent Version 4.0 of Oracle (CW, July 2). That release includes the mainframe software needed to achieve the micro-mainframe link as well as a more efficient coding structure.

Oracle for the Personal Computer XT, Personal Computer AT and for TI's Professional will be available Oct. 15. For the DEC Rainbow, the release date is Nov. 30. A minimum order of $6,000 is required, Oracle said.

The company is located in Building 3-180 at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

Hydroelectric dam project in India to put micro Oracle to test

By Paul Gillin
CW Staff

MONTREAL — The new microcomputer implementation of Oracle Corp.'s Oracle data base management system will be put through the wringer next month by one of the first users of the new software.

SNC, Inc., a large engineering procurement and construction company based here, has already moved a material controls application from a Digital Equipment Corp. VAX-11/780 superminicomputer to Oracle on an IBM Personal Computer XT with virtually no modifications, according to Gary O'Connor, SNC's data base administrator. The company plans to implement the application on 11 Personal Computer XTs for a project to build a hydroelectric dam in India beginning next month.

Users at the local sites in India will run the material controls application on the small machines and update an identical application running under Oracle on a VAX-11/780 in New Delhi, he said. "Considering that some of these areas have an average of 12 power failures a day, that'll be a real test," O'Connor said. But, he added, "Oracle has been able to handle it so far. We had 15 power failures here one night and still recovered."

O'Connor said the widely distributed nature of SNC's operations and the specter of an overburdened VAX-11 led him to request a pre-beta-site release of the new Oracle software this year. "We work on a project level and sometimes have to let little projects slip through our fingers because we don't hava the processing power," he said.

The SNC data processing department had written the material controls application using Oracle in early 1983. "We were happy with that, but a few projects came up where the users were [a long distance away]. The cost would have been staggering to [communicate] to projects in Africa or India."

The conversion effort required to move the application from Oracle on the VAX-11 to the 512K-byte Personal Computer XT "was just about nothing," O'Connor maintained. The only notable problem was encountered when a multiblock screen program would not run on the micro. "We broke it down to two individual programs and it ran perfectly," he said.

O'Connor added that the application now runs identically on the Personal Computer XT to the way it runs on the VAX-11. Tasks like creating partitions and views, altering clusters and granting privileges are the same, he said. "You can even lock a user out from accessing your view," he noted.

The application strains the memory capacity of the micro, slowing response times somewhat, he said. However, he said, the performance differences are negligible.

For the engineering project in India, O'Connor said, SNC plans to distribute copies of the material controls application to the local Personal Computer XTs. The users will periodically update the VAX-11 in New Delhi, possibly using Oracle Link, the micro-mainframe link announced by Oracle this week. The VAX-11 in Montreal will then be updated in batch mode, he said.

Previously, SNC had used remote terminals and 9,600 bit/sec communications lines on similar projects, O'Connor said. Use of the micros, "will take off some of the load so the VAX can be freed up for other work," he said.

Robotics industry seeks legislation to aid sales by offering tax incentives, investment credits

WASHINGTON, D.C. — The American robotics industry's trade association has called on the federal government to provide tax incentives and investment credits to manufacturers who buy robots. According to the Robotics Industry Association (RIA), the robotics industry posted a 49 cent loss on every dollar of sales last year and thus needs the legislation to promote sales.

RIA's request, made in June before a U.S. House of Representatives committee, has so far gone unheeded. However, the House is soon likely to be considering a bill that, among other things, would provide $8 million worth of aid to students studying robotics and would establish a national robotics center at the National Bureau of Standards.

Those provisions are part of S. 1286, a manufacturing technology research bill said to be ready to be reported out of the House Committee on Science and Technology. The bill would allot $250 million over four years for research into how U.S. manufacturers are using automation technology and which of those industries are endangered by foreign competition.

It also would establish several regional manufacturing systems research centers staffed by representatives of higher education and industry, among others.

The RIA's six-point plan mirrors one already adopted in Japan to aid that country's robotics industry, said Robert Smith, a lobbyist for the RIA.

Part of the RIA's proposal consisted of calls for low-interest loan guarantees for those who acquire robots and low-interest loans for leasing and buying robots. The proposal also asked for tax credits for robot users, but did not specify that the robots in use be American-made, said Jeffrey Burnstein, spokesman for the RIA.

Burnstein said the incentives were needed to protect against a singular reliance on foreign robots, which are now mostly coming from Japan.

"In a crisis [such reliance] is not a position you want to be in," he argued.

Burnstein said the incentives were needed to protect against a singular reliance on foreign robots, which are now mostly coming from Japan.

Better safe than sorry

It's better to be safe than sorry. That old saw still has sharp teeth, especially in today's information world. *Computerworld*'s October Special Report, "Protecting the Corporate Information Resource," will cover security issues in an age of hackers and nationwide networked data bases.

The Special Report will look at security considerations for mainframes and micros, hardware and software, equipment and personnel. It will review software and hardware solutions, power supply problems, disaster recovery and contingency planning, data encryption and transmission protection, fault-tolerant computing and locks on the computer room door.

Contributions should take one of two forms: a tutorial, discussing an issue or trend, or an applications story, outlining a user firm's experience.

Articles must be typed double-spaced and range in length from four to six pages. Artwork, such as charts, graphs or photos, is welcome. Authors should include a brief biography and a telephone number where they can be reached.

The deadline for submissions is Aug. 29.

If you have a story to tell or any questions to ask, send them to Donovan White, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

ENCOUNTER

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Ironically, some of SyncSort's most glowing recommendations come from the mouths of IBM systems engineers. Here's the latest example.

One of our systems engineers recently visited the computer center of a well-known worldwide manufacturer. His mission was to install and demonstrate SyncSort 2.5, the latest and most advanced release of our OS sort program.

As our man sat down at the console, an IBM "MVS Specialist" joined the group. "Can I help with the installation?" he asked. Of course, Our Man replied, thanks for the offer.

After SyncSort 2.5 had been installed, the IBMer came up with another helpful suggestion. "Would you mind if we benchmarked your sort against our 5740-SM1, Release 6? I just happen to have a copy here."

Not in the least, Our Man replied. It was the first duel between SyncSort 2.5 and Release 6 (also known as DFSORT). But our systems engineer was confident that 2.5 could outperform Release 6 anywhere, anytime.

The benchmark was run, and the results bore out Our Man's confidence. SyncSort 2.5 had outperformed Release 6 by a wide margin.

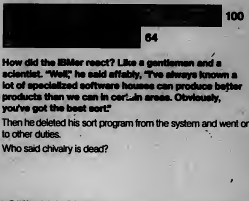
The IBMer was clearly disappointed. But he wasn't ready to concede yet. "Let's take a look at the results on the monitor I've installed," he said.

He explained that the monitor had an "awesome capability" for measuring total resource consumption. It produced an overall "resource utilization" index that reflected the aggregate impact of such vital items as SRB CPU Time, TCB CPU Time, and EXCPs.

Suppressing a grin, Our Man agreed. And this time the IBMer shot himself in the foot with his own monitor.

SyncSort 2.5 had outperformed Release 6 by a whopping 36% — as the charts below indicate:

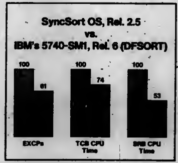
Resource Utilization Index



How did the IBMer react? Like a gentleman and a scientist. "Well," he said affably, "I've always known a lot of specialized software houses can produce better products than we can in certain areas. Obviously, you've got the best sort."

Then he deleted his sort program from the system and went on to other duties.

Who said chivalry is dead?



syncsort INC.

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Tandem cuts prices on low-end and mid-range systems

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — In a product move aimed at medium-scale processor users in the regional offices of large corporations, Tandem Computers, Inc. today reconfigured and trimmed the prices for several of its low-end and mid-range packaged systems.

The firm also added another configuration option to its line of Non-Stop 1+ packaged systems and announced an upgrade kit that reportedly transforms Non-Stop 1+ and Non-Stop II processors into Tandem's top-of-the-line TXP mainframe. In addition, the company cut the main memory prices for its Non-Stop II and TXP machines by nearly a third.

Today's price cuts apply to three varieties of Tandem packaged systems:

- Non-Stop 1+ configurations that expand in two-processor increments.
- Non-Stop 1+ configurations that expand in four-CPU increments.
- Non-Stop II configurations that expand in two-processor increments.

In the wake of Tandem's latest repricings, a two-processor Non-Stop 1+ system that used to sell for $126,000 per CPU now costs $89,000 per machine, according to Steve Schmidt, the company's vice-president of strategic planning.

If a user expands his configuration beyond 20 Non-Stop 1+ pairs, the price for each additional two-processor building block drops still further to $55,000 per CPU. In the past, each two-processor increment beyond the 20-pair limit cost $99,000 per machine, Schmidt said.

On the Non-Stop II side, Tandem has lowered the per-CPU price of a basic two-mainframe system from $195,000 to $129,500, he added.

Coinciding with Tandem's price cuts are several minor configuration changes to the entry-level versions of both the Non-Stop 1+ and Non-Stop II packaged systems. Until today, a dual Non-Stop 1+ or Non-Stop II package typically incorporated two disk units.

Under the revised pricing scheme, however, the same basic configurations now come with only one disk system, according to a Tandem spokeswoman. But because entry-level Non-Stop 1+ and Non-Stop II packaged systems are often used solely for development purposes rather than for production applications, one disk module is all that many users need, at least at the outset.

In the past, if Tandem had configured its packaged systems with just one disk unit alone, a basic Non-Stop 1+ offering would have sold for $101,150 per processor, compared with $170,150 per machine for a comparably equipped Non-Stop II configuration, Schmidt said.

Packages of four

Today's announcement also reported another configuration change to the firm's packaged systems line: For the first time, Tandem is now making its Non-Stop 1+ machines available in packages of four processors as well as in pairs, the spokeswoman said.

For any Non-Stop 1+ configuration consisting of 20 or fewer CPUs, each four-processor set is priced at $105,000 per machine. Thereafter, the price of every extra expansion package drops to $70,000 per mainframe, Schmidt said.

In further product-related moves, Tandem also trimmed the price of its 2M-byte Non-Stop II and TXP memory modules from $22,000 to $15,000 and priced its just announced upgrade kits at $70,000 to $90,000 per processor.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

Tandem's focus on mainframe sales intact despite latest pricing moves

CUPERTINO, Calif. — Although the latest price and configuration changes announced by Tandem Computers, Inc. today reflect a renewed emphasis on the low end of the firm's product line, the main focus of the company's business reportedly remains unchanged.

Tandem will continue to address the on-line transaction processing needs of large commercial accounts, which typically require two classes of mainframes — large ones of corporate computing hubs and medium-size ones for satellite locations — according to Steve Schmidt, Tandem's vice-president of strategic planning.

During the past few months, most of Tandem's product announcements have come at the high end of its processor line, which is geared primarily to large corporate data centers. With today's price and packaging revisions to the Non-Stop 1+ and Non-Stop II, the vendor has reportedly reaffirmed its intention to serve major organizations in their outlying offices as well as at their headquarter sites.

Tandem's decision to pare its Non-Stop 1+ and Non-Stop II prices will purportedly ease entrance barriers to the low end of the firm's processor line. In addition, the action is expected to stimulate product demand among field locations that might otherwise opt for medium-scale systems such as IBM's Series/1 and 8100, according to company Marketing Vice-President Jerry Peterson.

For Tandem itself, the price cuts will also reportedly correct a growing price and performance imbalance between the firm's entry-level Non-Stop 1+ and its TXP. Such an imbalance might eventually have caused the company problems by hindering sales of its low-end systems to divisional or regional locations.

Unix Systems Expo/84 set for Sept. 11 in Los Angeles

LOS ANGELES — Unix Systems Expo/84 will be held at the Los Angeles Convention Center Sept. 11-14. The focus of this conference and program seminar is on the productivity, system obsolescence and sales and marketing of Unix.

A speaker of national prominence will keynote each day of the four-day exposition, according to Computer Faire, Inc., the conference's producer and sponsor.

On Tuesday, Sept. 11, Richard G. Shahpazian, director of software sales and marketing for AT&T Information Systems, will focus on Unix systems in the world market.

On Wednesday, Sept. 12, Stuart W. Volkow, the franchise technical development officer of Gateway Computers, plans to address the marketing advantages of Unix and why it will become an increasingly stronger factor in the office automation industry.

John V. Roach, president, chief executive officer and chairman of the board of Tandy Corp., will discuss the markets and relevant economics for multiuser hardware on Thursday, Sept. 12.

On the last day of the exposition, Mayford L. Roarke, director of Fortune Systems Corp. and formerly the executive director of information systems at Ford Motor Co., will discuss integrating Unix in the corporate environment.

Prices for the conference are a $95 preregistration fee for four days of conference and exhibits ($135 on-site), $50 on-site for one day of conference and exhibits, $35 on-site for four days of exhibits only and $20 on-site for one day of exhibits only, according to the sponsor.

More information on Unix Systems Expo/84 can be obtained from Computer Faire, 181 Wells Ave., Newton, Mass. 02159.

LIBEL

from page 1

ciation, a trade group that represents members of the on-line data base industry.

Should the court affirm the decision of the Vermont Supreme Court upholding a verdict against the defendant, Dun & Bradstreet Corp., the IIA claims that economic data base firms and others in the information industry will be more vulnerable to libel damages than broadcasters or publishers. Currently, a newspaper publisher or a broadcaster has to have knowingly spread a falsehood or to have acted with reckless disregard for the truth before a libel claimant can win either punitive or compensatory libel damages against him.

Punitive and compensatory damages totaling $350,000 were levied by a Vermont jury against Dun & Bradstreet as a result of its erroneous statement that Greenmoss Builders, Inc., of Burlington, Vt., had filed for bankruptcy. The error was published in one of Dun & Bradstreet's "Business Information Reports" (BIR), a summary from a computerized economic data base that is mailed to clients, such as creditors, who request it.

The U.S. Supreme Court first heard the case in its last term and has asked that arguments again be presented in the fall, but this time solely on the issue of whether First Amendment protection extends to nonmedia speakers — such as an on-line data base — and to economic and commercial speech. Dun & Bradstreet corporate counsel Buffum Lovell said it does, but Tom Heilmann, attorney for Greenmoss Builders, said he does not "believe the First Amendment should apply" and that he failed to "see these imaginable horrors" predicted by the IIA.

Dun & Bradstreet has never denied that its BIR was in error, Lovell said. But, he maintained, it should not be subject to punitive or compensatory damages.

Heilmann, however, said that the Vermont Supreme Court ruled in its review of the case that the First Amendment protection to which Lovell referred "should not be extended to cover nonmedia defendants." He also argued that the jury did find actual damages of $50,000, damages proven by the company's losses.

Punitive damages, he said, were justified because Dun & Bradstreet "had failed to provide a sufficient retraction" and had hired a 15-year-old high school student to act as its reporter at the Burlington Federal Bankruptcy Court. Those, Heilmann claimed, were signs of recklessness.

The case has stirred another giant of the information industry, Dow Jones & Co., operator of Dow Jones News Retrieval and owner of the *Wall Street Journal*, to file a brief with the Supreme Court on behalf of Dun & Bradstreet's case. A similar brief has also been filed by the national office of the AFL-CIO.

AIM announces 1984 Who's Who

ROCKVILLE, Md. — The Associated Information Managers (AIM) has announced that the 1984 edition of "Who's Who in Information Management" is now available.

The guide is an alphabetical listing of AIM members responsible for managing information. Each listing includes a person's title, organizational affiliation, address and telephone number. The list is also cross-referenced by geographical location and organization representation.

AIM members receive one 1984 edition free and additional copies for $20 each; nonmembers can buy the guide for $35.

More information is available from AIM, 1776 E. Jefferson St., Rockville, Md. 20852.

Systems firm caught up in high-tech transfer furor

UK officials search firm's headquarters; U.S. officials seize records from Maryland office

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Systime, Inc., Britain's second largest computer manufacturer, has been searched twice in the last five months by customs agents in Britain and the U.S. looking for evidence of diversions of licensed technology to Warsaw Pact countries.

In the U.S., customs agents searched the company's offices in Columbia, Md., last April, while British customs officials searched the company headquarter's offices in Leeds, England, on July 19.

Systime is 41% owned by Control Data Corp. and is heavily involved in the import of computer equipment and supplies to England, where it resells them as integrated systems. Systime's imports are mostly Digital Equipment Corp. hardware, and in 1983 the company reported $60 million in revenues.

Robert McDonald, an assistant U.S. attorney in Baltimore, confirmed last week that U.S. customs officials swore out a search warrant April 17 against Systime in Columbia, Md., and searched the company offices the next day, seizing Systime business records.

> *A company that has been found to have violated licensing laws relating to the export of restricted technology to the Warsaw Pact countries can be placed on the export denials list for a specific period of time, as well as face fines.*

The U.S. Department of Commerce, which administers the Export Control Act, declined comment on the Customs action. Commerce spokesman Dan Lander said that Systime has not been placed on the Commerce Department's export denials list. Lander said a company that has been found to have violated licensing laws relating to the export of restricted technology to the Warsaw Pact countries can be placed on the export denials list for a specific period of time; as well as face fines.

CDC spokesman Gerald Hendin said last week, "It would be unfair and inappropriate for CDC to comment." Hendin referred questions to Systime officials in Britain.

Contacted in England, Systime President Rod Atwooll confirmed that Systime's U.S. offices and Leeds headquarters had been searched by U.S. and British customs officials on separate occasions. Atwooll said that Systime has been cooperating with the export investigation in the U.S. for the last 18 months and that U.S. investigators appear to be focusing on exports that were made two to five years ago. During that period, the Reagan administration began a campaign to convince its allies to tighten licensing of high-technology exports to Warsaw Pact countries, which culminated last month in a joint export restriction policy [CW, July 30].

British customs officials declined to confirm that a search of Systime's Leeds offices had been made.

Atwooll said that U.S. pressure on its European allies to slow technology transfers to Eastern bloc countries has helped to cause an industry-wide business slowdown in England and Europe in the last four months.

Atwooll said that his company has "not suffered any worse" than other companies dependent on U.S. technology exports. He said he did not think Systime faces U.S. penalties for export violations because the Commerce Department last week granted approval for an export license for shipment of computer hardware.

'Operation Exodus'

The U.S. Customs Service is currently administering a program, Operation Exodus, to catch companies which are diverting technology that is legally licensed for export to U.S. allies and then routing it to Warsaw Pact countries via third parties.

Last week, U.S. Customs spokeswoman Chris Fraser said the agency had no comment on the search of Systime's Maryland offices.

Systime's Atwooll said that British and U.S. investigators have sought information from the company on a DEC 11/782 machine shipment to Sweden that was seized last December on its way to Russia.

"It will be up to them to decide whether the licensing paperwork for the shipment is correct," Atwooll commented.

Atwooll said that the company, while heavily dependent on U.S. supplies for its business, was still able to carry on operations.

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Auto firms test AAR rail plan

In addition to maintaining dedicated-line connections to the Association of American Railroads' (AAR) Train II freight car information network, the major U.S. auto manufacturers are participating in a pilot AAR project to optimize usage of their own rail fleets.

According to Railinc Corp. President Henry Meetze, Chrysler Corp., Ford Motor Co. and General Motors Corp. all maintain rail cars used to transport inventory between manufacturing facilities. The AAR's Reload Project is designed to provide the companies with data that allows them to minimize the number of miles those cars move without freight.

Meetze said Reload uses car location information from the AAR's network, which is fed into a data base on an AAR IBM 3033 mainframe. Using the data base and an optimal distribution software model, an employee can balance supply and demand for the cars.

Railinc's organization

In Henry Meetze's view, the difference between the Association of American Railroads' (AAR) former Management Systems Department (MSD) and its offspring, Railinc Corp., can be summed up in one word: aggressiveness.

MSD was created in 1968 to provide data processing and communications services for the AAR and its standing committees. In 1982, the organization decided to transform MSD into a wholly owned, for-profit subsidiary. That step — which marked the birth of Railinc — was taken for tax reasons during a period of heavy capital investment, much of which involved new computer systems.

Railinc is divided into four internal organizations. The Business Management Division is responsible for long-range planning, budgets, personnel training and office automation implementation. Railinc's Information Processing Division handles computer facility operations and the nationwide data communications network and manages voice communications services for the AAR.

In addition, the Applications Programming Division coordinates software development and programming functions for Railinc and the AAR, and the Data Control and Production Division provides administrative DP support for the AAR committee structure. Taken as a whole, the divisions give Railinc the expertise it needs to develop computer systems designed to benefit the entire industry.

"We can handle those projects that would not be cost-effective if they were undertaken individually by the rail lines," Meetze said.

Computer, communications upgrades

By John Gallant
CW Staff

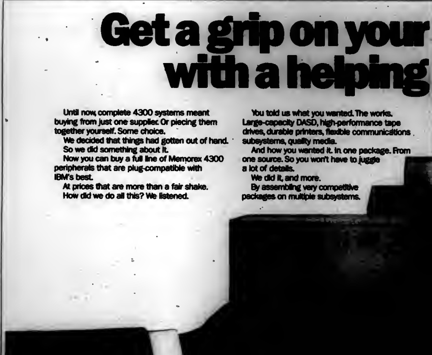
WASHINGTON, D.C. — In the wake of a series of fatal Amtrak train accidents, public attention has focused recently on the operation and management of U.S. railroads.

But in one area at least — that of computer and communications systems — the rail industry is boasting major improvements of late. In addition to the computerization efforts undertaken by individual rail lines throughout the nation, the Association of American Railroads (AAR) has enhanced and expanded its data management and communications facilities to streamline operations and position itself as a major supplier of information.

An internal AAR study conducted late last year indicated that the railroad industry has strengthened its information processing capabilities by nearly 50% since 1980. According to Henry Meetze, president of Railinc Corp., AAR railroads maintained some 700 computers in 1980. That figure had grown to well over 1,000 computers by 1983, an increase spurred by a 121% growth in the number of minicomputers employed by the railroads. Although the growth in mainframes was less rapid, the processing power in millions of instructions per second represented by those processors increased almost 125%, the study found.

Railinc is the computer and communications support arm of the AAR. Formerly the Management Systems Department of the AAR, the trade association representing more than 150 individual rail lines, Railinc was formed for tax purposes as a separate, wholly owned subsidiary in 1982 to undertake a number of large capital-intensive projects, many of which involved computer systems improvements.

According to Meetze, the 115 staff members of Railinc provide DP services to the nearly 80 working committees of the AAR and coordinate a variety of centralized computer systems designed to improve operations for AAR member rail lines. Recently,



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inject renewed vigor into slumbering rail industry

Railinc broadened its charter to become a supplier of freight and railroad information to major shipping lines and rail users, including the nation's automobile manufacturers. (see story page 10). Railinc is also providing that same data to some of the largest remote information services, such as Tymshare, Inc.'s Tymnet and General Electric Information Services Co.

At the heart of Railinc's information system is Train II, a computer and communications network that tracks more than two million freight cars, trailers and containers as they move over 300,000 miles of track owned by some 400 railroads. According to Meetze, Train II is a star network that links 72 computers — nearly all mainframes — and 13 remote job entry devices maintained by individual rail lines.

The core of the star is one of Railinc's 12 large computer systems, an IBM 4341 Model 2 mainframe that records nearly 750,000 car movement transactions daily. In addition to receiving data from AAR member computers across the country, the system is linked to three Westar satellites that feed information from data collection locations on the West Coast, the Midwest and the Southern states. The remote processors are linked via a series of analog and digital communications lines tied to Train II headquarters here from locations across the U.S and in Mexico and Canada.

According to Meetze, the movement transactions are posted to several large data bases that are accessible to members and other subscribers through the 4341 Model 2 or through an IBM 3033 maintained by Railinc. One of the data bases — the Freight Car Master — contains cargo information and the four most recent movements of the cars tracked by Train II.

Through a separate Car Service Data Base, Railinc provides national fleet information used by the AAR's Operations and Maintenance Department to allocate freight cars among rail lines. The AAR has the authority to order a railroad to provide cars to another line during a car shortage, such as a grain harvest or a national emergency, and this data base allows planners to fulfill that mandate in an orderly fashion.

Train II is also used for message switching among members and subscribers. Meetze said a recent report showed over 96,000 messages passing through the network each day, including freight waybills and bills of lading and administrative information passed between rail lines. While individual railroads can track shipments within their own territories, Meetze said Train II provides national visibility for the AAR members, who must cooperate even as they compete against each other.

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Olympics' messaging system carried unexpected load

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — They expected 50,000 users to log onto the system during its 16 days of operation, but they underestimated the usage by nearly twofold.

They expected the system to process an average of 140,000 transactions per day, but in actuality the processing volume exceeded their projections by more than 25%.

The same good fortune that spared the 23rd Olympiad from politically inspired violence or demonstrations, held local traffic jams to a minimum and presented Olympic organizers with a whopping profit also apparently extended to the 1984 Summer Games' Electronic Messaging System (EMS).

"Usage of the EMS exceeded even our most optimistic expectations," according to Bob Ford, a spokesman for AT&T, which developed and operated the system specially for the Summer Games.

Variety of services

Installed at the request of the Los Angeles Olympic Organizing Committee (LAOOC), the EMS provided a wide assortment of information services for the 93,000 accredited visitors to the quadrennial event. Among the users who were authorized to take advantage of the system were LAOOC officials, coaches, athletes and an estimated 10,000 foreign and domestic reporters.

Between the time the system went into full-scale operation on July 28 and the time it was dismantled on Aug. 13, it had performed some 2.8 million transactions — an average of about 180,000 transactions per day, Ford said.

Approximately 1.8 million of those transactions involved exchanges of electronic messages, with data base inquiries accounting for the balance of the EMS's processing work load, he added. Final statistics for the system's 16-day usage level were released last week.

The AT&T-created facility formed only one of many high-tech attractions at an Olympics that encompassed 28 major sites and 4,500 square miles of Greater Los Angeles real estate. Because some of the Olympic locations were as far apart as 200 miles, LAOOC officials could ill afford to rely on the same manual means of information exchange that had characterized previous Olympics.

Electronic network

So for the latest edition of the Summer Games here, the LAOOC commissioned the installation of a data communications network that electronically linked all the Games' key sites, including its 22 venues, three Olympic Villages, the press center and other locations.

Each node in the Olympic network had its own AT&T Teletype 5410 display terminals, which were connected by 10M bit/sec fiber-optic cables to AT&T 3B20 superminis at a nearby Pacific Northwest Bell Telephone Co. installation. In all, the network incorporated approximately 1,700 terminals and 15 of the Unix System V-based superminis, according to Wally McPherson, a software specialist with AT&T Network Systems.

Also embraced in the EMS were some 300 AT&T Teletype printers and an undisclosed number of IBM Personal Computers, which were situated at the 22 competitive venues and were used primarily for scoring purposes. After being electronically captured and certified by Olympic judges, all event results were entered into the Personal Computers, which relayed the information to an IBM 4381 situated in Long Beach, Calif.

From the 4381, the scores then went to the 3B20-based data center, where they were merged into a central repository of information that also included profiles of all the participating athletes and other background material. All the information was instantly accessible to reporters and other accredited users through any of the network's on-line 5410s.

In addition to allowing competitive results to be readily updated and disseminated, the network enabled users to send electronic mail anywhere in the 28-site Olympic complex. For the Games' accredited reporters, especially those from foreign countries, the EMS also proved useful for transmitting stories.

Some domestic woes

Most of the reporters' American counterparts, however, filed their stories through their own portable microcomputers or terminals, not always with entirely happy results. During the competition's first few days, for example, reporters were frequently plagued by a shortage of outgoing telephone lines and thus had serious trouble in transmitting their copy to their home offices.

"At first, I was constantly getting cut off when I got on the phone and tried to send a story back to my paper," according to Cincinnati *Enquirer* writer Lonnie Wheeler.

"I sometimes had to hang up and redial three or four times before I was finally able to send a story without being cut off. The interruptions were particularly distressing when I was facing a deadline and probably cost us several hundred dollars in wasted phone charges."

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NEWS

AT&T divestiture slows lottery gold rush

Backlog of private data line installations shows signs of decrease

By James Connolly
CW Staff

With jackpots overflowing at the $20 million mark, state lotteries have flourished in the past year, but they would be growing still faster except for the confusion generated by the AT&T divestiture.

Officials at the most affected lotteries recently reported that the worst divestiture-related problems are over, while other officials said their states have had few foul-ups.

But millions of dollars have been lost by states that cannot get timely installation of private data lines for new on-line betting terminals.

Illinois officials waiting for more than 200 private lines said that $10 million in lost revenues since January is a conservative estimate. In New York, the current 250-order backup translates to a total of $1 million to $2 million in unplaced bets each week. Massachusetts officials said an 85-line backup in the western half of the state has cost $2.5 million.

AT&T Communications, which coordinates with the divested Bell operating companies for installation of private lines, has conceded readily that backlogs exist and that on-time delivery of private lines is still the exception. They also reported that complaints from state lotteries have been particularly loud because of the states' reliance on dedicated lines running from mainframes to several thousand terminals in businesses such as news stands, drug stores and liquor stores.

> *Massachusetts officials ordered 85 private lines for the western half of the state in January. By early August, only 13 had been installed.*

"We have had some serious problems with having telephone lines installed. We were right up to snuff, and AT&T was right with us last year. But now we are 250 [telephone lines] behind, and that is a lot of lost revenue for us, although they are showing signs of catching up in the past couple of months," said Russ V. Gladieux, executive deputy director of the New York State Division of the Lottery. "[AT&T and Nynex] blame divestiture, saying that the process of building lines was destroyed," Gladieux added.

The New York lottery handles $21 million in on-line bets each week through almost 2,700 Control Data Corp. TDT and TVT terminals linked by multidrop lines to a customized string of CDC Cyber 18 minicomputers in the Albany area.

Massachusetts officials ordered 85 private lines for the western half of the state in January. By early August, only 13 had been installed, and retailers' requests for 25 to 30 more terminals remain "on hold," according to Massachusetts lottery marketing supervisor Ted Moriarty.

"We are starting to see some signs of life, however. They have been installing data boxes, but they just haven't been cleared back to us," Moriarty said.

Illinois State Lottery Deputy Superintendent Jerry Havener said, "We've turned the corner. We are still making up the backlog, but [Illinois Bell Telephone Co.] and AT&T have put in place new procedures, and we are getting delivery of new lines."

Havener reported that Illinois' line installation is now approaching the 31-day turnaround time experienced before divestiture, a 60-day reduction from the spring turnaround time. He credited the improvement to Illinois Bell's assigning account representatives solely to the lottery and to the company's greater care in assuring that orders are expedited and do not get lost.

However, several lotteries, including New Jersey, Washington and Arizona, reported few divestiture-related problems. New to the on-line lottery business, Washington and Arizona officials said they were ordering most of their lines late last year when divestiture loomed, so they took extra care in establishing procedures.

Anthony Battista, deputy director of the New Jersey lottery, credited a "pretty good" relationship with AT&T and New Jersey Bell Telephone Co. to the fact that the lottery is one of New Jersey's largest users of dedicated lines, with 3,500 agents. He said the companies have assigned representatives to a project team to assist in the transition as the lottery gears up to change mainframe and terminal vendors next year.

AT&T last week told the Federal Communications Commission that the private-line backlog stood at 44,300 at the end of July, and that the on-time delivery had risen from 20.3% to 29.1% since April.

Jim Burns, an AT&T Communications spokesman, said company officials have met with lottery officials from throughout the U.S. regarding the private lines, and that the company has almost doubled its private-line order-processing staff from 2,500 to 4,500.

"It's a shared problem requiring shared fixes," he noted.

Burns said companies such as Nynex, which deals with complex urban systems, have been particularly hard-hit with backlogs. Those areas require the most lines and carry the highest construction costs, he said.

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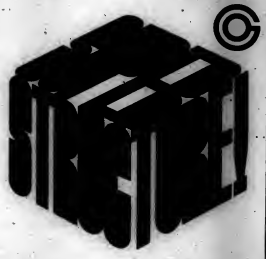

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TELECOM BRIEFS

Phil Hirsch
CW Washington Bureau

Western Union proposes local dial-up telex service

WASHINGTON, D.C. — A telex service that reportedly will provide substantial savings for some users has been proposed to the Federal Communications Commission by Western Union Corp. The company wants to begin offering the service this week.

The new service would allow Western Union's telex network to be accessed through local dial-up lines. The company's customers currently have to use leased lines, but these facilities will become much more expensive Nov. 13 if pending tariffs are implemented.

Initially, the dial-up service will operate at 50 bit/sec; however, 110 bit/sec operation is planned within several months, Western Union said, adding that domestic and international telex messages will be handled. The company also said customers will be able to use one telephone line alternately for voice and telex messages, or they can dedicate a line to telex.

The tariff for the service specifies a fixed monthly charge plus charges per minute of use. The fixed charge would be $15/mo in currently tariffed telex exchange cities and $45/mo elsewhere. For domestic calls, the per-minute charge would be 52 cents or 85 cents, depending on whether a Western Union station or another common carrier station was being addressed.

Along with the dial-up service, Western Union has requested increases in its present charges for dedicated access lines. The charges now range from $34/mo to $44/mo. The new rates, which have an Aug. 21 effective date, would be $20/mo higher.

AT&T requests date change for terminal lease increase

WASHINGTON, D.C. — AT&T Information Services, contending that it will suffer a $300 million revenue loss that "could not be adequately mitigated," has requested permission from the Federal Communications Commission to raise its leased terminal charges next May 1 rather than the following July 1.

Meanwhile, the International Communications Association (ICA), a users group, has asked the commission to refund some increases in leased terminal charges imposed earlier by AT&T.

ICA, which represents most of the nation's major corporate communications users, advised the commission to address the "massive delays that users have experienced, and continue to face at this time, in obtaining written embedded [customer premises equipment (CPE)] sales price quotations that contain sufficient detail to allow users to make financially sound lease/buy decisions."

Specifically, ICA wants the commission to issue a public notice containing "remedial ground rules and procedures" and to require AT&T to send the notice to each of its leased CPE customers. One ground rule would extend the price predictability program so that customers who have not yet received firm sales price quotes would have two years to make up their minds about retaining or replacing equipment. A customer would qualify for a refund if he asked for a firm sales quote and, before receiving it, was forced to pay AT&T a higher lease charge for the equipment.

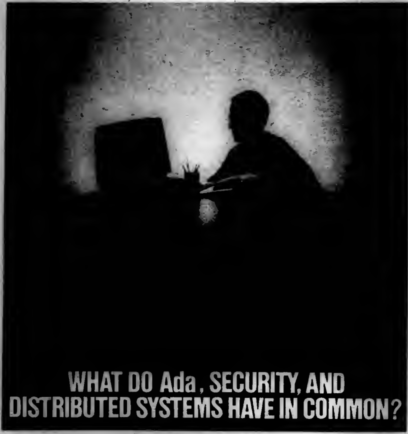
Five operating companies seek waiver of FCC rule

WASHINGTON, D.C. — Five more divested Bell operating companies have requested permission to offer packet-switched network services directly. Illinois Bell, Indiana Bell, Michigan Bell, Wisconsin Bell and Ohio Bell asked the Federal Communications Commission earlier this month to waive its requirement that the divested operating companies, if they offer such services, must do so through separate subsidiaries.

Late last year, in Docket 80-756, the commission said it would waive the requirement if a divested operating company's proposal for a basic packet-switched service could show, among other things, that the potential costs of separation would exceed the benefits. The five Midwestern divested operating companies hammered at this point in their recent petition. They stressed that converting asynchronous user code to packets at a telephone company's central office would greatly reduce terminal costs and make packet switching affordable for many data communications users.

The petition also reported that Michigan Bell plans to initiate its local packet network soon in the Detroit area, through four nodes equipped with packet assembly/disassembly equipment supplied by BBN Communications Corp.

Present packet network services vendors oppose letting the divested operating companies offer packet-switched services directly, and a major battle at the commission is likely. Seven similar petitions were submitted earlier. The latest one was filed by American Information Technology Corp. (Ameritech), of which the five Midwestern divested operating companies are subsidiaries.



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DESIGN from page 1

and test the code interactively and store the program — along with the diagrams and other relevant documentation — in a data dictionary. In addition, many products include project management software that can be used by management to coordinate and document the work of many analysts and programmers working on a single project.

The approaches that different products take to the engineering process are as diverse as the tools themselves. Some implement the software on a mainframe while others use networked microcomputers. A few vendors boast strong graphics and text handling for system design, while others stress coding aids and offer only rudimentary graphics.

Several of the available products are based on a strict system development methodology, whereas others are capable of adapting to whatever procedures are already in use. Some include project management routines while others do not.

Common thread

But if there is one common thread among all the products, it is that they are oriented toward the process of designing an information system rather than toward the task of coding it. In fact, many of the vendors believe their technologies take up the slack where advanced programming techniques fail.

"People are becoming dissatisfied with the results of the programming focus, and they need a way to do the whole process more efficiently," said Richard Ramsdell, senior vice-president of Nastec Corp., which makes the Case 2000 workstation.

Tim Bryce, an associate at M. Bryce and Associates, Inc., which sells Pride/Automated System Development Methodology, commented, "We talk to customers all over the world who say they have fourth-generation languages, personal computers coming out their ears, program generators and all this neat stuff, but they haven't got the slightest idea how to use it. Their problems aren't technical, they're management."

Computer-aided software engineering tools emphasize the kind of structure and discipline that nonprocedural languages and prototyping aids purposely avoid. Many observers compare the technology to computer-aided design (CAD). They point out that dramatic productivity improvements can be achieved if analysts and programmers are allowed to think projects through more carefully, unencumbered by the tedious manual details of drawing flowcharts and typing documentation.

However, the focus of software engineering tools on the total system life cycle may also be their biggest weakness. Many of the aids now on the market are experiencing the same difficulties that system development methodologies have faced for years. Because they require a greater degree of order and discipline, they often require potentially massive organizational changes. Programming shops that do not have strictly defined procedures or that do not closely follow those procedures may find the conversion to automated software engineering particularly painful, experts say.

"We tell people openly that if they're looking for a quick and dirty solution to their DP problems, this is not it," Bryce said. "The least expensive decision here is the price of the package. You're talking about a decision that has huge management ramifications on the company."

Perhaps for that reason alone, integrated software engineering aids are catching on slowly. "It takes a long time for major changes to occur [in an organization]," said Roger Pressman, president of R.S. Pressman & Associates, Inc., an Orange, Conn.-based consulting firm. "Companies that are further along in a system development environment are going to grab onto this more quickly. Those that are using 1960s-type programming are going to take much longer."

Pressman observed that vendors are partially to blame because of their eagerness to promise immediate productivity gains. "I think there's a strong analogy to the early CAD systems, where vendors were quoting productivity numbers that were far too high," he maintained. "What people find are that the impacts are in other areas, such as reusability of code and higher quality of software."

But because such improvements are necessarily long-term, the tools needed to achieve them are difficult to justify in a frantic DP environment, he said. "I don't think the resistance to this technology has to do with the bottom line so much as whether people are sure they can integrate these tools into their environment and have them pay off," Pressman stated.

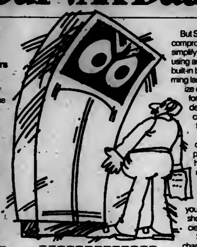
Harris Kent Swan, president of Solution Technology, Inc., an R&D firm in Boca Raton, Fla., agreed that many organizations are ill-prepared to change existing procedures in order to achieve uncertain benefits. "A totally integrated system is only for a shop that considers itself well-run and professional, but has too much work to do," he said. "If they don't have control, forget it."

In addition, computerized software engineering in many organizations is introduced by management mandate with little concern for the impact on DP professionals, he said. Because of the organizational issues, Swan believes, the tools that will fare best will be those that can be introduced gradually.

The temptation may be strong to wait until the pace of technological change settles down to implement new software engineering technol-

See DESIGN page 19

Who Really Manages Your VAX Data?



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PRODUCT SPOTLIGHT

Case Western implements automated design tools

CLEVELAND — The use of a system development methodology and computerized software engineering tools will virtually insulate Case Western Reserve University from future technological changes, according to the director of university information systems at the large institution here.

But progress will not come without some difficulty. For two years, Case Western has been in the process of converting its information systems to M. Bryce & Associates, Inc.'s Pride Automated System Development Methodology, and the project will probably continue for another two years, according to Thomas Leonard, director of university information systems.

Case Western chose to implement a methodology in order to prepare itself for future expansion of distributed processing as well as for an anticipated increase in central DP activity, Leonard said. Bryce's Pride methodology emphasizes defining the administrative procedures of an information system, whether computerized or manual, so that the data base is defined in terms of the functions of the data elements rather than in terms of the hardware or software that uses them.

Any changes in technology can be integrated by relating them to the functional data elements, Leonard said. "The most important thing, and the thing that has been most unattended, is to encapsulate administrative procedures," he said. "Those are the areas that rarely get documented."

Leonard's staff of 18 succeeded in identifying about 40% of the data elements that need to be identified while simultaneously moving from a Burroughs Corp. 1726 minicomputer to a Digital Equipment Corp. Decsystem-20 and while developing several new large-scale software systems. "All the data elements germane to a particular structure have to be qualified," he said. "Once that is done, you can begin to localize them in files and then prototype."

Leonard anticipates that the automated tools of Pride/ASDM will be heavily used in the future to design new information systems iteratively. "For example, a user and a consultant can begin to explore a need right at the user's terminal," he said. "If [the consultant] needs to know if the right data is available, he can interrogate the data base by feeding in attributes and also find what files are available that use that data."

"The analyst can, basically, quickly prototype the design for the user," he said. "If the user signs off on it, the analyst can just enter it into the data dictionary" and design the system around it.

See CASE page 19

SELECTED VENDORS OF COMPUTER-AIDED SOFTWARE ENGINEERING PRODUCTS

	AGS Management Systems, Inc. Interactive Systems Development Methodology (ISDM)	*Apollo Computer, Inc.* Domain Software Engineering Environment	*Boeing Computer Services, Inc.* Argus	*Cap Gemini Software Products, Inc.* Multipro
[redacted]				
Documentation				
On-line	Yes	Yes	Yes	Yes
Graphics and text capabilities	Optional	Yes	Yes	Yes
Word processing	Yes	Yes	No	Yes
Letter-quality printer	Yes	Yes	No	No
File "nesting"	Yes	Yes	Yes	Yes
[redacted]				
Design Support	1			
Single keystroke symbols	Not applicable	Yes	No	Yes
Unlimited user-defined symbols	Not applicable	Yes	Yes	Yes
Design logic analysis and validation	Not applicable	No	Limited	No
Design decomposition	Not applicable	Yes	Yes	Yes
Support reusable code	Not applicable	Yes	Yes	Yes
Methodology-independent	Not applicable	Yes	No	Yes
[redacted]				
Project Planning and Management				
Estimating Package	Yes	No	No	Yes
Project Planning Package	Yes	Yes	No	Yes
Quality assurance functions	Yes	Yes	Limited	Yes
Automatic task assignment	Yes	Yes	No	No
Document change control	Yes	Yes	Yes	Yes
[redacted]				
Other features	Open architecture permits interface between IBM mainframe and PC products. Guidance through development life cycle using menus and Help screens. Automated worksheet, word processing and document control. Provides critical path scheduling with resource availability.	Captures audit trails of all changes and persons associated with changes. Detects need to recompile source modules due to changes. User can establish module interdependency. Builds successive versions of software systems and controls evolution.	Supports Hewlett-Packard Co. pen plotters. Ability to define structured constructs in source code languages. User-definable source code templates.	Window management. Screen-form design and chaining capability. Menu generation. Macro command facility.
[redacted]				
Price	ISDM - $10,000 for first two copies. Estimating and scheduling, $47.50 extra. SDM/70 and/or SDM/Structured methodologies recommended. Each costs $44,000.	$1,500 (node license) $12,500 (site license)	Object code: $22,500 (Onyx) Source code: $22,500 (Onyx)	$24,000 for mainframe software. $6,700 per workstation (includes software and IBM Personal Computer/XT).
[redacted]				

1. Full guidance and support provided through design phases. However, automated design tools not provided.
2. Through mainframe interface.

CW CHART

Proper methodology, micro link yield variety of benefits

If you want to install a computer-aided software engineering system, you will find that the available technologies follow some very different philosophies. Among the major alternatives are whether to put the system on a mainframe or on networked microcomputers. Another choice is whether to use a system that is methodology-independent or one that requires the use of a system development methodology.

Using a methodology in concert with software engineering aids will give you the most bang for the buck, experts agree. However, it will also require some dramatic changes in the way you develop systems. "It's going to take you a while to get yourself organized and to impose certain disciplines. That scares the hell out of most American companies," said Tim Bryce, associate at M. Bryce & Associates, Inc., which sells a development methodology and automated software engineering tools.

But when you complete the multiyear process of installing a methodology and training your staff, you will probably experience some dramatic productivity improvements, particularly by having reusable code and well-defined data structures available. A good methodology can serve a company for many years, experts agree.

Other software engineering tools work with a variety of standard or custom methodologies, but do not offer the tight fit you get with an integrated package. Experts generally agree that such tools are best for organizations that do not function under strict development procedures or do not want to tie themselves to one methodology.

"You can get a significant benefit just by automating the things you're doing now," said Richard Ramsdell, who is senior vice-president of Nastec Corp., a vendor of a methodology-independent workstation.

Another choice is whether to use micro-based or mainframe-based technologies. Products like Nastec's Case 2000 or Index Technology Corp.'s Excelerator use stand-alone or networked micros, while others, such as Higher Order Software, Inc.'s USE.IT or Softool Corp.'s Programming Environment and Change and Configuration Control, require a mainframe.

The advantage of the micro environment is that terminals can communicate with each other and with a central source without tying up the mainframe, according to Roger Pressman, president of R.S. Pressman & Associates, Inc., a consulting firm based in Orange, Conn. Such an arrangement also does not require developers to rely on mainframe uptime in order to do their work. And the workstations can always be used as stand-alone micros if needed, Pressman said.

SELECTED VENDORS OF COMPUTER-AIDED SOFTWARE ENGINEERING PRODUCTS

	Higher Order Software, Inc. USE.IT	*Hughes Aircraft Corp.* [illegible] (Hughes Software Engineering Environment	*Index Technology Corp.* Excelerator	*M. Bryce & Associates, Inc.* Pride-ASDM
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Documentation				
On-line	Yes	Yes	Yes	Yes
Graphics and text capabilities	Yes	Yes	Yes	Yes
Word processing	Yes	No	Yes	Yes
Letter-quality printer	Yes	Yes	Yes	Yes
File "nesting"	Yes	No	Yes	Yes
[illegible]	[illegible]	[illegible]	Yes Yes [illegible]	Yes Yes Yes
Design Support				
Single keystroke symbols	Yes	Yes	Yes	Yes
Unlimited user-defined symbols	Yes	Yes	No	No
Design logic analysis and validation	Yes	Yes	Yes	Yes
Design decomposition	Yes	Yes	Yes	Yes
Support reusable code	Yes	Yes	Yes	No
Methodology-independent	No	No	Yes	No
[illegible]	[illegible] [illegible] [illegible] [illegible] Yes Yes	[illegible]	[illegible]	[illegible]
Project Planning and Management				
Estimating Package	No	Yes	No	Yes
Project Planning Package	No	No	No	Yes
Quality assurance functions	Yes	Yes	No	Yes
Automatic task assignment	No	No	No	Yes
Document change control	Yes	Yes	No	Yes
[illegible]	Limited	[illegible]	Limited	[illegible]
Other features	IBM Personal Computer emulator. Code portable to IBM. Error-free requirements used to generate error-free code. Assists in requirements definition. Code can be generated from requirements and design.	Computer-aided design-oriented graphics. "True" integration of tools. Methodology-based (DeMarco-Constantin-Yourdon). Used in-house since 1978. High-resolution graphics.	Integrated customizable report writer. Can define screens for data entry and query. Report mock-ups.	Fully integrated, based on engineering/manufacturing technology. "Artificial intelligence"-based. Information Resource Manager prototypes and models the business and its systems. Can be used by nontechnical end-users. Logical systems and data base design for all systems, manual and automated.
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Price	$82,000	$20,000 and up	$8,500 (1 quantity)	$115,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CW CHART

PRODUCT SPOTLIGHT

Design aids implemented gradually

By Paul Gillin
CW Staff

Because computer-aided software engineering often requires major changes in the ways in which MIS departments develop software, many users are implementing pieces of the systems while planning to migrate more fully to the automated tools in the future.

Liberty Mutual Insurance Co.'s Home Office Data Processing Center in Portsmouth, N.H., has used several Nastec Corp. Case 2000 workstations primarily as documentation aids since early 1982. The company is hoping to bring Case 2000 into the programming environment soon, according to Mary Alice Bennett, systems manager.

Liberty Mutual chose the Nastec equipment primarily because of the integrated text and graphics capability that allows such documentation as flowcharts, record layouts, copy libraries and text to be intermingled, Bennett said. "This also has the ability to interact with the mainframe," she said. "We hope to use it soon to access documentation on [IBM's] TSO. We can also back up documentation on the mainframe."

Case 2000 fits in well with a new set of documentation procedures that has recently been put into practice at the Liberty Mutual DP center, she said. A programmer or assistant can execute a few commands on the workstation to call up a skeleton document and then fill in the necessary fields, Bennett said. The procedures tend to enforce documentation standards that otherwise might not be followed, she said.

The department's immediate goal is "to get all documentation on [Case 2000], including high-level system documentation, program documentation, narratives and layouts," she said. Bennett added

See USER page 22

SELECTED VENDORS OF COMPUTER-AIDED SOFTWARE ENGINEERING PRODUCTS

	McDonnell Douglas Automation Co. **Studio/Draw**	***McDonnell Douglas Automation Co.*** **Data Flow Diagram Draw (DFDraw)**	***Nastec Corp.*** **Case 2000 workstation**	***Softool Corp.*** **Programming Environment and Change and Configuration Control (CCC)**
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Yes	[illegible]	[illegible]	[illegible]
[illegible]	Not applicable	[illegible]	[illegible]	[illegible]
[illegible]	No	[illegible]	[illegible]	[illegible]
[illegible]	No	[illegible]	[illegible]	[illegible]
Documentation				
On-line	No	No	Yes	Yes
Graphics and text capabilities	Yes	Yes	Yes	No
Word processing	No	No	Yes	Limited
Letter-quality printer	No	No	Yes	Yes
File "nesting"	Yes	Yes	Yes	Yes
[illegible]				
Data flow diagrams	Yes	[illegible]	[illegible]	[illegible]
[illegible]	Yes	[illegible]	[illegible]	[illegible]
[illegible]	Yes	[illegible]	[illegible]	[illegible]
Design Support				
Single keystroke symbols	Yes	Yes	Yes	No
Unlimited user-defined symbols	Yes	No	Yes	No
Design logic analysis and validation	Limited	Limited	Yes	No
Design decomposition	No	No	Yes	Limited
Support reusable code	Yes	No	Yes	Yes
Methodology-independent	Yes	Yes	Yes	Yes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Project Planning and Management				
Estimating Package	Not applicable	Not applicable	Yes	No
Project Planning Package	Not applicable	Not applicable	Yes	No
Quality assurance functions	Not applicable	Not applicable	Yes	Yes
Automatic-task assignment	Not applicable	Not applicable	Yes	Yes
Document change control	Not applicable	Not applicable	Yes	Yes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Other features	Can handle very large diagrams. Size of diagrams easily changed. Interface to off-line plotters. "Rubberbanding" of text when single element is manipulated. Easy to learn.	Designed for analysts and designers using data flow diagrams. Interface to Epson America, Inc. FX-80, FX-100 printers and Hewlett-Packard Co. desktop plotters. Large diagram capability. Pan and zoom capabilities. Can be learned in about 1/2 hour.	Can manage and support up to 128 users in clustered environment. File compatibility with popular microcomputers. Word processing features in graphics mode. Supports most structured development methodologies.	Design environment to be released early 1985. Automates military standards for software development. Programming environment and CCC integrated. Common syntax.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$25,000	$500	$10,500 per workstation (quantity 30) includes 384K-byte workstation, software. Design Aid ($550) and Lifecycle Manager, a joint product of Nastec and Spectrum International, Inc. ($1,800) optional.	$12,000 to $60,000, depending on hardware environment.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CW CHART

CASE from page 16

Case Western also uses the System 1022 data base management system from Software House, Inc. of Cambridge, Mass., to define data within a file. "If [the analyst] finds out that the file he needs is unique, he can describe it and its attributes. [System 1022] will generate a catalog," Leonard said.

By using automated design aids, Case Western's DP staff has been able to cut back dramatically on the time required to redesign a piece of a system, Leonard noted. "If the user tells us to go back to the drawing board, that would have taken a week under the old system. [Now . . . the analyst] can change the file specifications and design and come up with a new design in a few hours."

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[illegible] will be [illegible] he said.

DESIGN from page 15

ogies. But T. Capers Jones III, a consultant at Nolan, Norton & Co. believes the time to sieze the opportunity is now.

Jones, said the companies that have stabilized their development procedures will move far more rapidly into the next generation of software engineering than those that have failed to enforce guidelines. "In the next few years you'll probably see a widening of the gap between those generations."

Despite the roadblocks, many experts believe computer-aided software engineering technologies will be ubiquitous by the mid-1990s. "The tools that are now available are so good that it's going to be difficult not to use them," said Dr. Edward Bersoff, president of BTG, Inc., a Vienna, Va.-based computer system engineering company that uses such tools extensively. "We are faced with a far greater demand for products than we can deliver. As the jobs get more complex, [engineering aids] will catch on."

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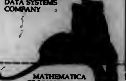

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USER

from page 18

that having flowcharts and layouts immediately available eases the task of making changes.

However, Liberty Mutual has not yet brought the Case 2000 into the system development process. The firm is negotiating with Nastec to adapt the workstation to Liberty Mutual's internal system development methodology. Ideally, Bennett said, she would like to see the workstations located throughout the DP operation and used for design, coding, documentation and maintenance.

Another user of a piece of a software engineering technology hopes that the tool will become a standard for configuration change control among contractors who work with the Department of Defense (DOD).

Neil Frigand, software configuration control manager in the DOD's Armaments, Munitions and Chemical Command (Amccom) at the Picatinny Arsenal in Dover, N.J., said Amccom brought in Softool Corp.'s Change and Configuration Control (CCC) package last fall to automate a change-management procedure that had previously been done manually. "Under the old system, if a [program] problem was noted in the field, they would get back to the programmer, and he would make the changes," he said. "If the programmer had left or changed jobs, we had to use whatever documentation he had left behind." The issue was especially critical because a change in a single subroutine of a large program could easily affect a dozen other subroutines, Frigand said. Amccom chose CCC because it combined five essential capabilities, he said. The product automates both change and configuration control; it is integrated; it includes both data compression and encryption; it has its own security procedures; and it runs on a variety of hardware.

Frigand offered an example of how CCC is now used at Amccom. If a change has to be made to a subroutine, "the software librarian goes into CCC and makes the changes. CCC will tell me what was changed, in what routine, on which data, for what reason and what other subroutines were affected," he said. "If I concur with the changes, I make a note that goes into the system. If three months later a developer wants a version of the subroutine without the changes, CCC can produce an exact copy without [them] in it."

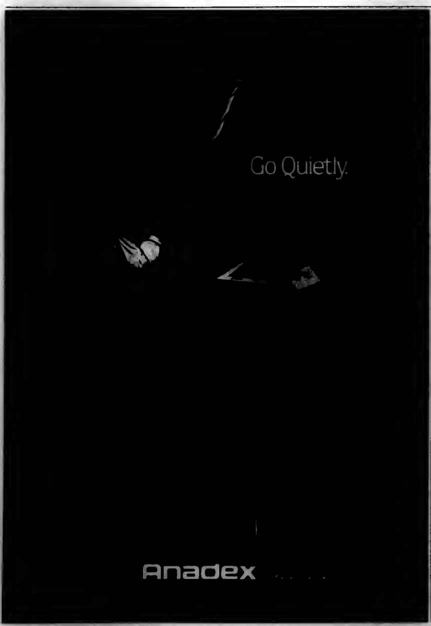
In addition, since CCC tracks only changes to the software, it can recreate past versions without having to store the entire package, Frigand said. "It used to be that it was never clear what changes were made or why," he said. "It was a disaster. Since we started using CCC, [my staff] now spends about two hours of the day working on changes. Before, we spent as much as a whole day."

Now Frigand is hoping to convince defense contractors to use CCC on products that will be sold to the military. Such standardization would allow change control to extend throughout the entire product life cycle, he said.

Another company that has brought an engineering aid in-house because of its design capabilities is CC Services, Inc., an insurance company in Bloomington, Ill. The CC Services DP department uses Index Technology Corp.'s Excelerator on an IBM Personal Computer XT to draw data flow diagrams, data descriptions and process descriptions, according to Susan Bonacorsi, senior programmer/analyst. Those items, along with descriptions and comments, are also maintained in a data dictionary, she said.

"You can draw a data flow diagram, hit a DESCRIBE key and go into the dictionary," she said. "When you've entered your description, you can go right back to the diagram." In addition to being a lot of fun to use, Bonacorsi said Excelerator "hopefully takes some of the monotony out of the [design] process."

The product is being used to model all activities in a policy processing application in preparation for a total rewrite of that software, she said. The plans are to create a new logic diagram on Excelerator and store it in a design dictionary for use as a basis for coding. Bonacorsi said the company plans to match the Excelerator data dictionary with the mainframe dictionary for use as a programming outline.



HARDWARE ROUNDUP

Photo courtesy: McDonnell Douglas Automation Co.

A Look at 188 Systems From 32 Vendors

By Tom Henkel
CW Staff

Computerworld publishes its annual Hardware Roundup in three installments. Mainframes and superminicomputers are featured this week. Data on the top minicomputers will appear next week, followed by the top microcomputers on Sept. 3.

The Hardware Roundup has two basic formats. This week's installment lists relative performance and millions of instructions per second (Mips) information about the listed processors. As in the past, this performance information will not be provided with the minicomputer and microcomputer segments of the roundup. The reason for the different formats is that *Computerworld* believes, as do many consultants and industry analysts, that the DP professional buys a mainframe or superminicomputer for different reasons than an office manager buys a microcomputer.

DP executives often look for raw computing power capable of supporting the diverse needs of multiple users. Users of minicomputers and microcomputers, on the other hand, tend to seek a solution to a specific set of business problems. For them, computing power becomes less of a consideration. Also, since many microcomputers have been designed around a handful of industry-standard microprocessors, providing CPU performance figures can be less meaningful than with the more unique mainframes and superminicomputers.

In 1983, Computerworld's Hardware Roundup listed characteristics of 147 mainframes and superminicomputers manufactured by 26 vendors.

This year, the Hardware Roundup updates the information listed last year and includes characteristics of new processors. Some additional vendors have been included in this year's survey. In all, 32 vendors were polled and a total of 188 systems were evaluated.

Computerworld's Hardware Roundup is not intended to be used as a buyer's guide. The annual survey was designed to provide our readers with a summary of the processors currently on the market.

Most of this information has been supplied by the vendors. *Computerworld* does not endorse any vendor's product, architecture or methodology. Furthermore, unless specified otherwise, all the information contained in the Hardware Roundup should be considered to be vendor claims.

The relative performance and Mips information provided for the mainframes and superminis section is meant to put individual processors into perspective within the total marketplace. Actual performance can vary greatly, depending on the system work load, configuration, number of concurrent users and the quality of software.

There are no simple ways to measure system performance accurately. The Hardware Roundup cannot be used as a substitute for specialized benchmarks or professional consulting services.

IBM

Characteristics / System	8130A	8130B	8140	8150A	8150B	System/36 Model 4	System/36 Model 6	System/36 Model 8
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips²	.2	.3	.36	.86	.96	.2	.2	.52
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price (Memory Size)	$19,040³ (768K)	$37,800⁴ (1M)	$60,000⁴ (1M)	$82,500 (2M)	$115,000 (2M)	$51,980⁶ (1M)	$82,840⁶ (2M)	$140,340 (4M)
[illegible]	None	None	None	None	None	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	1,500	1,500	800	Not Available	Not Available	1,100 (Per 4 Bytes)	400 (Per 4 Bytes)	400 (Per 4 Bytes)
[illegible]	None	None	None	None	None	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	None	None	None	None	None
[illegible]	No	No	No	No	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$10,000	$10,000	$10,000	$10,000	$10,000	$7,500	$7,500	$7,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers were designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. CW estimates.
3. For an A21 processor.
4. For a B23 processor.
5. For a B71 processor.
6. Includes 64.5M bytes of disk storage.

IBM

Characteristics / System	3083-EX	3083BX	3083 Model JX	3081 Model GX	3081⁴ Model KX	3084 Model QX
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips²	3.3	6.0	8.4	12.5	16.3	29.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$960,000 (8M)	$1,735,000 (16M)	$2,580,000 (32M)	$2,835,000 (16M)	$3,365,000 (16M)	$6,930,000 (64M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	24	24	24	24	24	24
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	Not Available	Not Available	Not Available	64K	64K	64K
[illegible]	[illegible]	No	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor only.
4. The 3081 processors employ dyadic, or two closely coupled, processors. The buffer size listed is per processor.

IBM

Characteristics / System	4321	4331-11	4331-2	4341-9	4341-10	4341-1	4341-11	4341-2	4341-12	4381-4	4381-5	4381-1	4381-2
Relative Performance¹	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips²	.19	.26	.26	.40	.58	.72	.88	1.1	1.2	.79	1.14	2.1	2.7
Memory size in bytes (Minimum-Maximum)	1M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$64,000 (1M)	$82,420 (1M)	$82,500 (1M)	$81,000 (1M)	$170,000 (4M)	$205,000 (2M)	$240,000 (2M)	$350,000 (4M)	$500,000 (16M)	$150,000 (2M)	$200,000 (2M)	$370,000 (4M)	$500,000 (4M)
[illegible]	None	None	None	[illegible]	None	None	None	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	900 (Per 4 Bytes)	900 (Per 4 Bytes)	900 (Per 4 Bytes)	150-300	150-300	150-300	120-240	120-240	115-230	100 (Per 4 Bytes)	100 (Per 4 Bytes)	66 (Per 4 Bytes)	68 (Per 4 Bytes)
[illegible]	2	2	2-4	3-6	3-6	3-6	6	6	6	1-4	3-6	6-12	6-12
Cache (Buffer) size	None	8K	8K	2K	8K	8K	8K	16K	16K	8K	16K	8K	32K
[illegible]	No	No	No	[illegible]	[illegible]	No	No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$7,500	$7,500	$10,000	$10,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems, they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
2. For the processor only.

AMDAHL CORP.

System / Characteristics	5840	5850	5860	5867	5868	5870	5880
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips¹	8.4	11.6	14	22.0	22.0	28.6	28.8
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$2,080,000 (16M)	$2,360,000 (16M)	$2,800,000 (16M)	$3,410,000 (24M)	$4,070,000 (32M)	$4,220,000 (32M)	$4,720,000 (32M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	23.25	23.25	23.25	23.5	23.5	23.25	23.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size⁴	64K	64K	64K	64K	64K	128K	128K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. The 5860 have two 32K-byte buffers. The 5870 and 5880 have four 32K-byte buffers.

NATIONAL ADVANCED SYSTEMS, INC.

System / Characteristics	AS/6620	AS/6630	AS/6650	AS/8023	AS/8043	AS/8053	AS/8063	AS/8083	AS/9040⁶	AS/9050⁶	AS/9060⁶	AS/9070⁶	AS/9080⁶
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips¹	1.6	2	2.4	2.9	5.24	6.52	8.43	9	7.2	9	11.2	16.2	20
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$255,000 (2M)	$341,500 (4M)	$417,500 (4M)	$838,000 (4M)	$1,255,000 (8M)	$1,768,000 (8M)	$2,251,000 (8M)	$3,506,000 (16M)	$1,758,000 (8M)	$2,258,000 (8M)	$2,729,000 (16M)	$3,706,000 (16M)	$4,722,000 (16M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	40	60	50	46	40	40	35	56	38	38	30	38	30
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	64K	64K	64K	32K	32K	64K	64K	128K⁵	64K	64K	256K	128K⁵	512K⁵
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$9,500	$9,500	$9,500	$19,000	$19,000	$19,000	$19,000	$19,000	$19,000	$19,000	$19,000	$19,000	$19,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. CW estimates.
3. Includes processor, console, power supply and all prerequisites.
4. Main memory enhancements are available in 2M- 4M-, 8M- and 16M-byte increments depending on the model.
5. Cache memory per CPU.
6. Amdahl Corp. offers a vector processor attachment for the AS/9000 models which costs $300,000. When this option is included, the AS/9000 series processors become known as AS/9100 models. For example, an AS/9080 with the vector processor option would be called the AS/9180.

Since 1977, some of the most significant software developments have taken place in a small town in Illinois.

Urbana, Illinois does not readily come to mind as a wellspring of advanced software development. Yet here, in what many might call a "think-tank" atmosphere, a cohesive group of software engineers and computer scientists is producing the software that will set standards far into the future.

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1101 East University Avenue,
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(800) 952-8888 or (217) 384-8500.

GOULD
Electronics

GLOBAL ULTIMACC SYSTEMS, INC.

Characteristics / System	USX40	USX43	USX44	USX46
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.56	.50	1.01	1.06
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$121,000 (2M)	$150,000 (4M)	$175,000 (4M)	$215,000 (8M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	100	100	100	100
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	16K	32K	32K	64K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$6,500	$6,500	$6,500	$6,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. CW estimates.
3. The USX40 configuration includes processor; three channels; disk controller; a 1,270M-byte double-density disk drive; a tridensity, 125 in/sec tape drive; tape controller; a 1,500 line/min printer; power supply; and all prerequisites. The USX43 configuration includes the same components as the USX40 but with six channels. The USX44 and USX46 are dual processor configurations of the USX40 and USX44, respectively.
4. A two-year, full payout lease with investment tax credit.

IPL SYSTEMS, INC.

Characteristics / System	4443	4445	4460	4480
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	1	1.5	1.6	2.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$93,500 (2M)	$165,000 (4M)	$195,800 (4M)	$443,000 (8M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	50	50	50	50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	8K	24K	24K	48K[4]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$8,250	$8,250	$8,250	$8,800

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. Has two 24K-byte buffers.

NIXDORF COMPUTER CORP.

Characteristics / System	8890 Model 10	8890 Model 30	8890 Model 50	8890 Model 70
[illegible]	17	[illegible]	[illegible]	[illegible]
Mips[2]	.25	.25	.5	.7
[illegible]	1M	1M-2M	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$32,500 (1M)	$61,665 (1M)	$71,840 (1M)	$100,000 (2M)
[illegible]	$1,140 (2 Year)	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	200	200	200	200
[illegible]	2	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	64K
[illegible]	Yes	Yes	Yes	[illegible]
Price per 1M byte of main memory	None[5]	$6,350	$6,350	$6,350

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. For the processor, power supply, console and all prerequisites.
4. In addition to channels for attachment of IBM peripherals, Nixdorf 8890 processors are equipped with microprocessor-controlled I/O processors to which Nixdorf peripherals can be attached. There are eight such channels available on the Model 70, six on the Model 50 and four on the Model 30, the vendor said.
5. The Model 10 is available only in a preconfigured 1M-byte version.

CAMBEX CORP.

Characteristics / System	1636-10	1641-1	1641-11	1651-1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.60	.72	.90	1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$98,500 (1M)	$130,000 (2M)	$155,000 (2M)	$215,000 (4M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	50	50	50	50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	8K	8K	8K	8K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$7,500	$7,500	$7,500	$7,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. Includes processor, console, power supply and all prerequisites.

CONTROL DATA CORP.

Characteristics / System	Cyber/180 810	Cyber/180 830	Cyber/180 830 (Dual CPU)	Cyber/180 835	Cyber/180 845	Cyber/180 855	Cyber/180 855 (Dual CPU)	Cyber/180 990	Cyber/180 990 (Dual CPU)
Mips[1]	1.0	1.6	2.9	3.8	8.5	12.6	22.5	22.3	38.1
Purchase Price[3] (Memory Size)	$147,500 (2M)	$249,500 (2M)	$384,500 (2M)	$740,000 (4M)	$1,275,000 (4M)	$1,780,000 (4M)	$2,840,000 (4M)	$3,350,000 (8M)	$6,000,000 (8M)
Machine Cycle Time (Nsec)	50	50	50	50	16	16	16	16	16
Cache (Buffer) size	None	None	None	16K or 32K	16K or 32K	16K or 32K	16K or 32K	32K	32K
Price per 1M byte of main memory	$7,500	$7,500	$7,500	$15,000	$25,000	$25,000	$25,000	$60,000	[illegible]

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers were designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, power supply, console and all prerequisites (except for the 810, 830 and Dual 830, which do not include console).

BURROUGHS CORP.

Characteristics / System	B1990SP	B2925	B3955	B4925	B4955	B5919-1	B5919-2	A9-B	A9-D	A9-F	B7900F	B7900H	B7900K
Mips[1]	.27	.55	.88	1.65	2.2	.64	.64	1	1.5	1.8	6.6	11.2	25
Purchase Price[3] (Memory Size)	$58,300 (512K)	$125,000 (1M)	$198,000 (1M)	$385,000 (2.5M)	$780,000 (5M)	$88,500 (4.6M)	$150,000 (3.1M)	$351,000 (6M)	$433,800 (6M)	$613,000 (6M)	$2,000,000 (12M)	$3,000,000 (12M)	$4,000,000 (12M)
Machine Cycle Time (Nsec)	166	190	143	110	110	200	200	72.5	72.5	72.5	125	125	125
Cache (Buffer) size	8K-12K	None	None	None	None	None	None	8K	8K	None	144K	144K	144K
Price per 1M byte of main memory	$12,000	$12,000	$12,000	$10,000	Not Available	$15,000	$15,000	$10,000	$10,000	$10,000	$25,000	$25,000	$25,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor, console, power supply and all prerequisites.
4. Burroughs processors use data link processors in place of conventional I/O channels.

HONEYWELL, INC.

Characteristics / System	DPS 8/47	DPS 8/49	DPS 8/52	DPS 8/62	DPS 8/70	DPS 88/81	DPS 88/82
Mips[1]	.73-1.2	1.1-4.5	1.1-4.9	1.2-5.9	1.8-7.2	7.2	13
Purchase Price[3] (Memory Size)	$153,000 (2M)	$253,000 (2M)	$450,000 (2M)	$650,000 (2M)	$700,000 (2M)	$2,880,000 (16M)	$4,080,000 (32M)
Machine Cycle Time (Nsec)	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Cache (Buffer) size	32K	32K	32K	32K	32K	64K	128K
Price per 1M byte of main memory	$7,500	$7,500	$20,000	$20,000	$20,000	$20,000	$20,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor only. Each of the models in the DPS 8 line can accommodate multiple processors.

TANDEM COMPUTERS, INC.

Characteristics / System	NonStop TXP
Mips[1]	4-32
Purchase Price (Memory Size)	$322,000 (4M)
Machine Cycle Time (Nsec)	83.3
Cache (Buffer) size	128K-1M
Price per 1M byte of main memory[4]	$11,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. Vendor claims.
3. The available number of processor I/O ports.
4. Available only in 2M-byte increments costing $22,000.

HONEYWELL, INC.

Characteristics / System	DPS 6/40	DPS 6/45	DPS 6/75	DPS 6/95	DPS 7/35E	DPS 7/65E
Mips[1]	.4	.4	.7	1.8	.5[2]	1.35[2]
Purchase Price[3] (Memory Size)	$37,330 (512K)	$49,900 (512K)	$69,150 (1M)	$104,900 (2M)	$85,200[5] (1M)	$215,700[5] (2M)
Machine Cycle Time (Nsec)	250	250	200	125	330	140
Cache (Buffer) size	None	None	8K	8K	None	None
Price per 1M byte of main memory	$8,000	$9,000	$9,000	$8,000	$10,000	$10,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. Vendor claims.
3. CW estimates.
4. Includes processor, console, 80M-byte disk drive, 5-1/4 in. diskette drive and 5-1/4 in. diskette drive. The DPS 6/45 purchase price also includes Honeywell's System Control Facility.
5. Includes a unit record processor, console, keyboard, remote maintenance adapter and a diskette unit. The DPS 7/35E configuration includes two I/O channels; the DPS 7/65 includes four I/O channels.

SYNAPSE COMPUTER CORP.

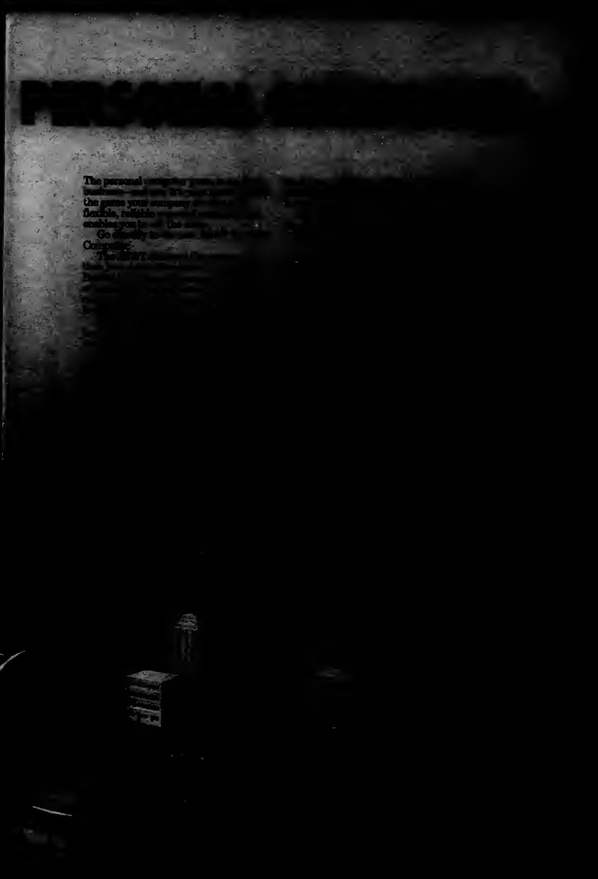
Characteristics / System	Synapse N+1
Mips[3]	2.8-14
Purchase Price[2] (Memory Size)	$168,000 (8M)
Machine Cycle Time (Nsec)	100
Cache (Buffer) size[4]	16K
Price per 1M byte of main memory	$14,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. CW estimates.
3. For a five-processor system configured for a transaction processing work load, the relative performance figure is 155. The vendor said up to 28 processors can be used. In a 28-processor configuration, the relative performance would be 868.
4. Per CPU.

DIGITAL EQUIPMENT CORP.

Characteristics / System	Decsystem-10 1095	Decsystem-10 2065
Mips[2]	1.5	1.5
Purchase Price[3] (Memory Size)	$425,000 (8M)	$405,000 (8M)
Machine Cycle Time (Nsec)	133	133
Cache (Buffer) size	16K	16K
Price per 1M byte of main memory[4]	$7,000	$7,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply, a minimum tape and disk configuration and all prerequisites.
4. An abstract price for 1M byte of main memory. Main memory is available in 1M word, or 8M-byte increments.



PERSONAL [illegible]

The personal [illegible] business—and [illegible] the game your company [illegible] flexible, reliable [illegible] enables you to [illegible] the [illegible]

Go directly to [illegible] Computer.

The AT&T [illegible]

HARDWARE ROUNDUP

NCR CORP.

Characteristics / System	V-8635	V-8645[4]	V-8655[4]	V-8665[7]	V-8675[8]	V-8685[9]	V-8695[10]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	1	1.9	2	2.8	3.7	5.5	7.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$455,000 (4M)	$695,000 (4M)	$970,000 (8M)	$1,215,000 (8M)	$1,455,000 (8M)	$2,190,000 (12M)	$2,895,000 (16M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	38[5]	38[5]	38[5]	38[5]	38[5]	38[5]	38[5]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	32K	128K	64K	160K	256K	384K	512K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$16,200	$16,200	$16,200	$16,200	$16,200	$16,200	$16,200

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. Dual processor.
5. For each processor.
6. NCR said each I/O channel is capable of supporting up to four strings of devices.
7. Three-processor system.
8. Four-processor system.
9. Six-processor system.
10. Eight-processor system.
11. Up to 64 channels are available if an optional dynamic channel director is used.

NCR CORP.

Characteristics / System	V-8645-II	V-8655-II	V-8665-II	V-8675-II[4]	V-8685-II[4]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.2	.26	.42	.61	.77
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$41,500 (1M)	$54,000 (1M)	$70,000 (2M)	$123,000 (4M)	$170,000 (4M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	84	56	56	56[5]	56[5]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	None	None
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$7,500	$7,500	$7,500	$7,500	$7,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. Dual processor.
5. For each processor.
6. NCR said each I/O channel is capable of supporting up to four strings of devices.
7. Up to 64 channels are available if an optional dynamic channel director is used.

SPERRY CORP.

Characteristics / System	System 80 Model 4	System 80 Model 6	System 80 Model 8	System 11UP	System 11MP	1100/71 H2	11/70 H2	1100/91	1100/92	1100/93	1100/94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.20	.37	.70	.5	.9	1.6	2.9	7.5	14	20	25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$86,062 (262K)	$94,062 (512K)	$123,900 (1M)	$85,219 (4M)	$122,974 (4M)	$301,080 (2M)	$509,370 (4M)	$2,865,880 (8M)	$4,984,953 (8M)	$6,854,246 (16M)	$9,231,539 (32M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	180	180	124	108	108	116	116	30	30	30	30
[illegible]	1 or 3	1 or 3	1-8	Variable	Variable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	None	None	32K	64K	64K	128K	192K	256K
[illegible]	Yes	Yes	Yes	Yes	Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$2,956	$2,956	$14,400	$7,500	$7,500	$12,160	$12,160	$20,000	$20,000	$20,000	$20,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. Systems are available with a disk cache memory ranging from 32K to 1M byte.

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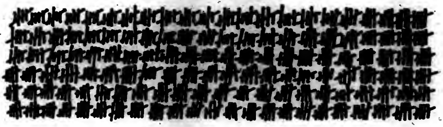

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[illegible]

DIGITAL EQUIPMENT CORP.

Characteristics / System	Microvax-I	VAX-11/725	VAX-11/730	VAX-11/750	VAX-11/780	VAX-11/782	VAX-11/785
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.3	.36	.36	.72	1.06	1.8	1.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$13,980 (512K)	$24,980 (1M)	$21,500 (1M)	$47,000 (1M)	$145,000 (2M)	$385,000[5] (4M)	$195,000 (2M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	810	810	810	400	280	310	166
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	8K	None	None	4K	4K	16K	32K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$4,000[6]	$4,900	$4,900	$4,900	$4,900[4]	$4,500	$4,500[4]

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For a basic configuration consisting of 2M bytes of main memory, power supply, cabinetry and a VMS operating system license.
4. Memory upgrades are available in a minimum 2M-byte configuration for $9,000.
5. Includes 52M bytes of disk storage.
6. Available in only 512K-byte increments.

AT&T

Characteristics / System	3B20S	3B20A	3B20D
[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	1	1.8	1.8
[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$230,000	$330,000	$340,000
[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	Not Available	Not Available	Not Available
[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	8K	12K	16K
[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$4,900	$4,900	$4,900[4]

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For a basic configuration.
4. For a dual-processor configuration, users must install memory in 2M-byte increments, which cost $8,900.

PRIME COMPUTER, INC.

Characteristics / System	Series 50 2250	Series 50 2550	Series 50 9650	Series 50 9750	Series 50 9950
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[1]	.47	.73	.9	1.75	2.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$38,900 (512K)	$86,500 (2M)	$145,500 (2M)	$250,500 (4M)	$392,000 (4M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	160	160	160	100	80
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	2K	16K	16K	16K	16K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte[5] of main memory	$10,500	$10,500	$10,500	$7,560	$7,560

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Purchase price includes central processor, diagnostic processor, cabinet, chassis, Primos operating system and minimum disk/tape configuration.
4. Available I/O chassis slots.
5. Purchase price for add-on memory.
6. Leasing prices are subject to interest rate fluctuations, customer credit rating and product mix.

HEWLETT-PACKARD CO.

Characteristics / System	HP 3000 39	HP 3000 42	HP 3000 48	HP 3000 68
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.56	.56	.56	1.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$41,500 (512K)	$67,200 (1M)	$109,050 (2M)	$231,770 (3M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	105	105	105	75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	8K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$12,000	$12,000	$12,000	$12,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.

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PERKIN-ELMER CORP.

System / Characteristics	3205	3210	3230	3250XP	3200MPS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.50	1.01	1.97	3.04	5-21[4]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$25,000 (512K)	$42,000 (256K)	$112,000 (1M)	$212,700 (2M)	$247,000 (2M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	Not Available	250	250	Not Available	Not Available
[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	1K	8K	8K[5]
[illegible]	[illegible]	[illegible]	[illegible]	Yes	Yes
Price per 1M byte of main memory	$4,900	$9,000	$9,000	$9,000	$9,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. Vendor claims.

2. Includes processor, console, power supply and all prerequisites.

4. The 3200MPS can support multiple attached processors.

5. There is an additional 1K byte of buffer storage for each attached processor unit.

DATA GENERAL CORP.

System / Characteristics	MV/4000SC	MV/4000	MV/8000 II	MV/10000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.6	.8	1.2	2.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$38,400 (1M)	$63,400 (1M)	$125,300 (1M)	$211,070 (2M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	200	200	220	140
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	16K	16K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$4,900	$4,900	$4,900	$4,800

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. CW estimates.

3. For the processor with disk and tape units, system software and system console.

MICRODATA CORP.

System / Characteristics	M8000
[illegible]	[illegible]
Mips[2]	.54
[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$69,950 (512K)
[illegible]	[illegible]
Machine Cycle Time (Nsec)	160
[illegible]	[illegible]
Cache (Buffer) size	None
[illegible]	[illegible]
Price per 1M byte of main memory	$5,950

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. CW estimates.

3. Includes a 100/50 in./sec streaming tape drive, a 128M-byte Winchester disk subsystem and eight I/O ports.

WANG LABORATORIES, INC.

System / Characteristics	VS85	VS90	VS100	VS300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	1.3	.77	1.3	3.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$64,000 (1M)	$73,000 (1M)	$105,000 (1M)	$170,000 (4M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	160	160	160	120
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	32K	32K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$8,000	$8,000	$8,000	$8,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. Vendor claims.

2. Includes processor, console, power supply and all prerequisites.

4. Wang offers a five-year rental plan instead of a conventional lease.

5. Capacity for I/O processors or device controllers.

BTI COMPUTER SYSTEMS, INC.

System / Characteristics	BTI 6600	BTI 8000
[illegible]	[illegible]	[illegible]
Mips[2]	.3	.30[4]
[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$40,950 (128K)	$180,000 (2M)
[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	300	200
[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None
[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$14,000	$14,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. CW estimates.

3. For a 2M-byte processor including power supply and all prerequisites.

4. For a uniprocessor. Up to eight CPUs can be configured in a BTI 8000 cabinet.

HARRIS CORP.

System / Characteristics	Harris 60	Harris 600	Harris 700	Harris 800	Harris 1000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	.76	.76	.89	1.1-1.6	4.9
Memory size in bytes (Minimum-Maximum)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$69,900[6] (768K)	$38,900 (768K)	$49,900 (384K)	$139,000 (768K)	$250,000 (1.5M)
Lease Price [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	300	300	300	180	75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	6K[4]	6K[4]	6K[4]	6K[5]	6K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$13,000	$13,000	$13,000	$13,000	$13,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. CW estimates.

3. Includes processor, console, power supply and all prerequisites.

4. Optional.

5. Optional on some models.

6. Includes an 80M-byte disk drive, 25 in./sec cartridge tape drive and the firm's VOS operating system.

FOUR PHASE SYSTEMS, INC.

System / Characteristics	Series 2000 Model 380
[illegible]	[illegible]
Mips[2]	.5
[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$9,665 (512K)
[illegible]	[illegible]
Machine Cycle Time (Nsec)	125
[illegible]	[illegible]
Cache (Buffer) size	None
[illegible]	[illegible]
Price per 1M byte of main memory	$3,000

4. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers were designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.

2. Vendor claims.

3. Includes a Motorola, Inc. 68010 application processor, a paging memory management unit, 512K bytes of random-access memory, a master I/O controller, a six-port serial controller, a disk bus controller, a disk controller, a 5M-byte removable media Winchester disk drive and a 15M-byte fixed media Winchester disk drive.

ELXI

System / Characteristics	6400
[illegible]	[illegible]
Mips[2]	4-40
[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$247,000 (8M)
[illegible]	[illegible]
Machine Cycle Time (Nsec)	25
[illegible]	[illegible]
Cache (Buffer) size	16-160
[illegible]	[illegible]
Price per 1M byte of main memory	$6,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers were designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.

2. CW estimates.

3. For a CPU, I/O processor and multiplexer. The vendor said up to 10 CPUs can be added to the system at a cost of $132,000 per CPU. The price of a fully configured system is $1,505,000, the vendor said.

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CW [illegible]

CHARLES RIVER DATA SYSTEMS, INC.

System / Characteristics	Universe 2203T	Universe 68/05	Universe 68/137
[illegible]	[illegible]	[illegible]	[illegible]
Mips²	1.25	1.25	1.25
[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$20,900 (512K)	$16,000 (512K)	$20,900 (512K)
[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	320	320	320
[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	4K	4K	4K
[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$3,000	$3,000	$3,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor estimates.
3. Includes processor, operating system, power supply and all prerequisites.

STRATUS COMPUTER, INC.

System / Characteristics	Stratus/32 FT 200	Stratus/32 XA 400	Stratus/32 XA 600
[illegible]	[illegible]	[illegible]	[illegible]
Mips²	.9	2	3
[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$123,200 (2M)	$186,000 (4M)	$270,000 (16M)
[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	125	125	125
[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	48K
[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$16,000	$10,000	$10,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.

APOLLO COMPUTER, INC.

System / Characteristics	DN 300, DN 320	DN 600	DN 460, DN 660
[illegible]	[illegible]	[illegible]	[illegible]
Mips²	.7	.7	1.2
[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$15,900 (1M)	$31,500 (1M)	$38,500 (1M)
[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	Not Available	Not Available	Not Available
[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	20K⁴
[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$5,000	$5,000	$6,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. Includes processor, power supply, console and the vendor's Domain local-area network.
4. Cache memory includes 4K bytes for instructions and 16K bytes for data.

GOULD, INC. COMPUTER SYSTEMS DIVISION

System¹ / Characteristics	Concept 32/27	Concept 32/67	Concept 32/97
[illegible]	[illegible]	[illegible]	[illegible]
Mips³	1	3	10.1
[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price⁴ (Memory Size)	$85,000 (1M)	$115,000 (1M)	$245,000 (4M)
[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	150	150	75
[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size⁶	None	32K	32K-64K
[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$9,500	$9,500	$9,500

1. The Concept line was designed to operate with Gould's MPX operating system. The same basic systems are available with Gould's UTX version of AT&T's Unix operating system. These systems are called the PN6000 and PN9000 and support virtual memory.
2. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
3. CW estimates.
4. For the processor, 2M bytes of main memory, 80M bytes of disk storage, a tape unit and systems software.
5. Available CPU slots to which I/O devices can be attached.
6. The 32/67 and 32/97 are available in dual processor configurations. On those systems, cache memory is doubled.

COMPUTER DESIGNED SYSTEMS, INC.

System / Characteristics	Advisor 32/60	Advisor 32/80	1400/32	2800/64
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips²	4.2	14.6	2.6	3.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$280,000 (1M)	$280,000 (1M)	$263,000 (256K)	$326,000 (256K)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	125⁵	125⁵	200	100
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	256K	256K	16K	32K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$62,000	$62,000	$24,800	$24,800

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. The 32/60 processor is available with an 80M-byte, 30 nsec read-only memory which reportedly enhances performance.
5. A performance enhancement feature is available which reduces the machine cycle time to 75 nsec.

FORMATION, INC.

System / Characteristics	F4000 Model 100	F4000 Model 200	F4000⁴ Model 200AP	F4000⁵ Model 300	F4000⁵ Model 300AP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips²	.20	.32	.36	.24	.36
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price³ (Memory Size)	$57,000 (1M)	$70,000 (1M)	$82,500 (1M)	$87,000 (2M)	$123,400 (2M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	800	800	800	800	800
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	None	None	None	None	None
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory	$10,000	$10,000	$10,000	$10,100	$10,100

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. For the processor and main memory only.
4. The firm's Model 200 attached processor operates only under IBM's VM/370 operating system.
5. Model 300 processors feature fail-soft capabilities, the vendor said.

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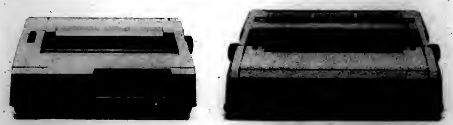

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Postal Service to use Ada in mail-handling centers

DOD language may become postal standard but faces competition from C

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Ada, the Department of Defense's new standard high-level programming language, will be put to use by the U.S. Postal Service (USPS) next year in two new mail-handling centers, which will route letters and parcels on conveyor belts to their proper discharge points, a USPS official said in a recent interview.

Frank A. Amoroso, program engineer for the USPS mechanization design branch, said Ada will be used to program central computers at the new facilities in Springfield, Mass. and Phoenix, both of which will be completed in 1985. The move makes the USPS one of the pioneers in the use of Ada outside the Defense Department, where Ada was developed, Ada experts said.

At the Phoenix center, the Ada-programmed central computer will control three separate mail-handling systems: a mail sack sorter, a parcel sorter and a letter tray sorter. The computer systems subcontractor is Amphion, Inc. of Ann Arbor, Mich.

At the Springfield center, the computer will control a single sack-sorting system; the subcontractor is the Ann Arbor Computer Division of Jervis B. Webb Co., also of Ann Arbor.

Ada is being used now in such commercial applications as the payroll of a manufacturing plant, inventory and parts control and the control of kidney dialysis machines in one hospital.

In both cases, the contractors selected computers from Intellimac, Inc. of Rockville, Md., using the Motorola, Inc. 68000 microprocessor chip and Ada compilers from Telesoft, Inc. of San Diego.

Amoroso said credit for the move to Ada goes to Ron Buren, the USPS consultant who is an analyst at IG Associates in Alexandria, Va. Amoroso and Buren said they chose Ada because of its portability, readability, modularity, suitability for real-time process control and low maintenance costs.

Ultimately, the USPS could standardize its software and use Ada for all new mail facilities, Amoroso said. But an Ada standard is not guaranteed because Ada will have to compete with the C language for specification in future facilities, he added.

One observer, Steven B. Weissman, editor of the *Ada Data* newsletter, published by International Resource Development, Inc., questioned whether the USPS facilities are complex enough to require Ada. "It struck me as overkill," he said.

Amoroso acknowledged that the smaller Springfield facility is a "borderline" case for Ada, but maintained that Ada is clearly appropriate for the three mail-sorting systems at the Phoenix center.

Mail sorting is just one of several nonmilitary applications for which Ada has been specified. Ralph Crafts, executive vice-president of EVB Consulting, Inc. in Rockville, Md., said Ada is being used now in such commercial applications as the payroll of a manufacturing plant, inventory and parts control, language translation and the control of kidney dialysis machines at one hospital.

In addition, DP and MIS managers in the banking, finance and insurance industries are interested in Ada, according to Dr. Philip Caverly, director of the Ada Technology Center at Jersey City State College in New Jersey. "They face the same problems the military did — too many incompatible computers and languages and horrendous maintenance fees."

"They are very receptive, but they want to see . . . how it saves money, time and effort," Caverly said of the DP managers. "There's a tremendous education effort needed out there."

Tom Dent, vice-president of sales and marketing for Telesoft, Inc., the dominant producer of Ada compilers, said he foresees such commercial applications as aircraft navigation, on-line banking, telecommunications message switching, corporate tax accounting and airline reservation systems, as well as government operations at the Federal Aviation Administration and the National Aeronautics and Space Administration.

Asked about Ada's future in the commercial marketplace, analyst Tucker Taft, of Intermetrics, Inc. in Cambridge, Mass., said, "The only problem is that there aren't as many compilers out there as we would like to see." But he added that many compilers are expected to surface in the next six months.

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CW [illegible]

Survey analyzes corporate crisis communications

MCLEAN, Va. — Crisis! A food produced by your company is contaminated, and you need to reach customers quickly. Or poisonous gas from a railroad accident escapes into your plant's neighborhood, and the community must be warned immediately. How do you communicate?

American business is being held to rigorous standards of conduct and accountability in cases like these. Yet only half of America's largest corporations have a crisis communications plan, and many of these were created in response to a previous crisis. These findings appear in a study, commissioned by Western Union Corp., of the top 1,000 industrial and top 500 service companies identified by *Fortune* magazine.

The survey found that industrial accidents, environmental problems and relations with the investment community are the primary circumstances under which a crisis communications program would be put into effect. Other situations where a plan would be used, ranked in order, were: hostile takeovers, rumor suppression, strike notice, proxy fights, product recalls and government regulatory problems. Many companies cited data communications breakdown as a potential crisis, but breach of computer security was not reflected in survey responses.

The vast majority (81%) of companies with a plan handle crisis communications internally. Among the companies that use outside resources to assist in the communications process, most use a public relations firm. News releases, telephone calls and press conferences are the most commonly used elements in corporate crisis programs. Newspaper advertising is used more frequently than radio and television advertising, and the U.S. mail is also a method of reaching people. Electronic mail and Western Union Mailgrams are included in about one-third of the plans.

Judith Cronin, senior product manager at Western Union Mailgram, said that because Mailgrams are frequently used by companies in a crisis, Western Union decided to commission the study. "We wanted to be able to assist [the companies] more in the planning stages," Cronin said.

A new brochure from Western Union offers help in corporate crisis communications planning. "When Every Second Counts . . . Crisis Communications Planning" outlines procedures and considerations for immediate, effective and responsible corporate communications, according to Western Union. It also provides information on how to use Mailgrams in time-critical situations.

The brochure is free and can be obtained by writing to Cronin at Western Union Electronic Mail, Inc., Department 13, 1651 Old Meadow Road, McLean, Va. 22102.

Information management topic of expo

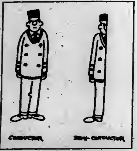
NEW YORK — A four-day exposition and conference on information management will be held at the New York Coliseum Oct. 1-4, with some sessions taking place at the nearby Sheraton Centre Hotel. Info '84: The 11th International Information Management Exposition & Conference was designed for executive end users who use information systems in decision making and in managing their businesses and for MIS and DP managers.

Charles E. Exley Jr., president and chief executive officer of NCR Corp., will be one of two keynote speakers. Exley will address the impact of new integration technology on the science of information management. A second keynote address will be delivered by Marv Goldschmitt, vice-president of Lotus Development Corp. Goldschmitt will speak about computer software piracy.

Approximately 70 sessions will be grouped into three broad categories: personal business computers, office automation and information systems. More than 300 exhibitors are expected to participate.

Prices for Info '84 are $440 for four days, $275 for two days, $165 for one day and $95 for a half day. The cost of the exhibition only is $5 through preregistration and $20 at the door.

More information is available from Show Manager, Info '84, 999 Summer St., Stamford, Conn. 06905.



WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

House panel asks agencies for more thorough DP review

WASHINGTON, D.C. — A U.S. House of Representatives panel has urged federal agencies to conduct more thorough investigations of their data processing operations to discover weaknesses in internal controls that could lead to waste, fraud or abuse in government programs.

The House Committee on Government Operations made the recommendation in an Aug. 2 report evaluating the first-year implementation of the Federal Managers' Financial Integrity Act of 1982. The act requires federal managers, for the first time, to establish a continuous process for evaluating, improving and reporting on the internal control and accounting systems for which they are responsible.

The committee said 10 federal agencies reported that they had identified weaknesses in their internal controls over DP operations that could lead to abuse or inefficiency, but most agencies failed to probe weaknesses thoroughly in such DP areas as software development and DP center operations.

"The committee urges agencies to assess the adequacy of their [DP] reviews and to take corrective action to assure that future reviews cover all [DP] internal control systems," the report said.

Congress OKs NBS budget, rejects ICST funding cut

WASHINGTON, D.C. — The U.S. Congress recently approved a fiscal 1985 budget for the National Bureau of Standards that includes $10 million for the Institute for Computer Sciences and Technology (ICST), rejecting a 50% budget cut proposed by the Reagan administration.

House and Senate conferees accepted the House-passed budget of $10 million, abandoning the $5 million budget supported by the Reagan administration and adopted by the Senate [CW, June 25]. The House and Senate then approved the conference agreement on Aug. 8 and 9, respectively, and forwarded the final appropriations bill to the White House for President Reagan's signature.

The ICST develops domestic and international computer standards and helps federal agencies manage computer technology. The Reagan administration had proposed that the domestic standards work be turned over to the private sector, but lawmakers apparently were swayed by testimony that the budget cut would cripple the institute [CW, March 12].

Federal computer matching to track welfare cheats

WASHINGTON, D.C. — Three federal agencies recently announced computer matching programs aimed at identifying persons who should not be receiving government welfare benefits.

■ The U.S. Department of Housing and Urban Development said that this month it would begin a computer match of tenant records from its subsidized housing projects with state and federal wage data to determine whether tenants have underreported their income to qualify for subsidized housing.

■ The U.S. Department of Health and Human Services said it will begin a pilot program to match its welfare rolls for Supplemental Security Income with state files of interest income from financial institutions in order to detect unreported income. Initially, the computer match will involve the California Franchise Tax Board's data on interest income.

■ The Immigration and Naturalization Service said it has signed agreements with state officials in California, Illinois and Colorado granting them access to the Immigration Service's automated record system via on-line terminals to check the immigration status of aliens applying for welfare benefits. Illegal and temporary aliens are prohibited by law from obtaining welfare benefits.

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INTERNATIONAL REPORT
CW International News Network

BELGIUM

GHENT — Flanders Technology International '85, billed as the trade show for the third industrial revolution, will be held here Feb. 5-March 3. The event, featuring imported technology, investment technology and electronic funds tranfer technology, is being sponsored by the Flemish authorities of Belgium.

JAPAN

TOKYO — Ricoh Co. Ltd. recently introduced two microcomputers based on Intel Corp.'s 80181 and 80286 microprocessors, respectively. The first, called the SBC-16 series, features Microsoft Corp.'s MS-DOS operating system software, a 12-in. amber monochrome and 14-in. color display and 256K bytes of random-access memory (RAM), expandable to 896K bytes, the vendor explained. Up to 720K bytes of external memory is available on 5¼-in. floppy disk drives, and other options include a mouse unit, IBM's 3270 Systems Network Architecture (SNA), IBM 3770 and 3780 emulation software, Digital Research, Inc. CP/M 86 operating system software and expansion RAM boards.

The supermicrocomputer using the 80286 microprocessor is a multibus system capable of using Xenix-286, MP/M 86 and the Concurrent CP/M 286 operating systems. Memory capacity is 512K bytes of RAM, expandable to 8M bytes, the vendor said. The system also reportedly comes with 20M bytes of Winchester disk storage, expandable to 40M bytes; floppy disk storage of 1M byte; one RS-232C port and one Centronics Data Computer Corp. port; a local-area network option and Ethernet compatibility.

■

TOKYO — The Japanese motion picture company Toho Co. Ltd. plans to market personal computer software featuring an adventure series of electronic games. The products, called Godzilla and Kaitei Gunkan, are scheduled to be unveiled here in September and later in the U.S. They run on NEC Corp.'s PC8801 and PC8801-Mark2 and Fujitsu Ltd.'s FM7 and FM77, according to the vendor.

■

YOKOHAMA — Dixy Corp., a one-year-old company bankrolled by Sony Corp., Olivetti Holding B.V. and the Pacific Technology Venture Fund, has reportedly developed a flat information display panel based on ionized-gas plasma display technology. The Dixy Display Panel is said to provide sharper graphics with lower voltage requirements than its traditional cathode ray counterparts. The product features a matrix of 640 by 400 pixels in a 192 by 120mm viewing area, for an 85 line/in. graphics display with flicker-free resolution, according to the vendor.

■

TOKYO — Japan Digital Laboratory Co. has established an American subsidiary called JDL, Inc. in Westlake Village, Calif. The subsidiary will introduce a high-resolution color serial matrix printer intended for use with multifunction office automation workstations in the U.S. General release is slated for later this year, a spokesman said.

NETHERLANDS

EINDHOVEN — Philips Information Systems, Inc. has teamed up with Siemens AG of West Germany to develop submicron chips. Specifically, the joint venture plans to produce a new generation of memory chips and perfect manufacturing techniques for 1M-bit and 4M-bit chips, a spokesman said. The research and development facilities will be located in the Netherlands.

■

AMSTERDAM — The Dutch postal telephone and telegraph (PTT) authority has cut subscription fees in half for its packet-switched X.25 Datanet 1 network and lowered volume fees as well, a spokesman reported. At the same time, a "partial subscription" plan was unveiled for subscribers with low traffic volumes, aimed at users with point-of-sale terminals and teletext terminals.

■

AMSTERDAM — Western Union Telegraph Co. of the U.S. and the Economic and Transport Planning Group of London have joined forces with the Dutch PTT to finalize plans for a fiber-optic and satellite telecommunications network based here. Before Nov. 1, almost all arrangements are scheduled to be complete. The project, called Amsterdam Telecenter, will be constructed by the PTT with Wetern Union acting as a consultant.

■

THE HAGUE — The Dutch PTT has signed a $10 million contract with Sperry Corp. for four Sperry 1100 mainframes and related software for its Integrated Telecommunications Clients Information Systems project. The project is intended to support all financial and administrative procedures for several of the company's telecommunications departments, it was learned.

TAIWAN

TAIPEI — The first attempt of National Advanced Systems, Inc. (NAS) to sell one of its plug-compatible mainframes here, to Taiwan's Veterans General Hospital, has met with stiff competition from IBM Taiwan Corp. IBM has cut the price on its 3083 system by 15% and has offered to throw in one AS/8043 and 10 7380 disk drives for free. NAS presently has no installations in Taiwan, while IBM reportedly enjoys an installed base of 184 systems. IBM Taiwan's nearest market competitor here is Control Data Corp., with 25 installations, sources revealed.

WEST GERMANY

BONN — The Ministry for Research and Technology here is unhappy over increasing difficulties in obtaining U.S. technology, sources said. The ministry reportedly plans to contact the U.S. Department of Commerce and the governments of countries in the European Economic Community that are suffering from the same trade restrictions. A spokesman for the ministry said that the U.S. position has not been consistent and complained that the U.S. State Department and the Department of Commerce were much more liberal than the present U.S. Secretary of Defense, Caspar Weinberger.

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On-line system refines Mobil's credit card operations

KANSAS CITY, Mo. — Neither hail nor sleet nor snow nor rain could stop them — credit card receipts. They would roll in waves across the country, millions of these flimsy pieces of paper. Some would make the journey by mail, others by plane. Some would be picked up by truckers making gas deliveries earlier in the week. They would arrive here, at Mobil Oil Cor[illegible]'s data processing center, to be unbundled and fed into the firm's computer system.

It was, on average, a 10-day trek for these little sales tickets. But that was three years ago, when Mobil's credit card program was a paper-based operation.

That situation has changed. A year ago, following a successful pilot project, the company installed an on-line transaction processing system, designed to capture and send credit card purchase information electronically from its service stations to its DP center. At present, approximately 2,500 stations are a part of Mobil's network.

At these stations, attendants record transactions by entering information into a point-of-sale (POS) terminal that is connected to an on-line data base of customer credit information. The data is transmitted to Mobil's DP center, where the card is authorized and the sale registered. Then it is uploaded to the firm's billing system for batch processing.

According to John Rowerdink, who manages the POS system for Mobil, the new system has provided benefits for the company, as well as for its customers.

"The system made our credit card operation run more efficiently, which meant that [in times of high interest rates] we were able to continue to offer the service," Rowerdink said.

It has decreased the number of bad credit sales and has reduced the occurrences of credit fraud, he explained. In addition, it has cut down on the firm's operating expenses by removing the necessity of processing millions of pieces of paper.

But the primary advantage, Rowerdink said, has been the reduction of credit card "float," the time period between purchase and payment. "With this system," he explained, "we capture the purchase information immediately."

At the heart of the system lies a six-processor Nonstop II and TXP system designed by Tandem Computers, Inc., a Cupertino, Calif., firm. The system runs Tandem's Guardian proprietary operating system. Mobil has developed an on-line data base using Encompass, Tandem's relational data base program. A Tandem 6100 communications subsystem manages front-end data communications for the POS terminals.

Currently, Mobil has installed 10 128M-byte disk drives and four 254M-byte drives in its Kansas City center. Each Tandem processor can hold up to 2M bytes of main memory.

Mobil's POS terminals are connected to the DP center by a combination of 1,200 bit/sec and 9,600 bit/sec telephone circuits. Multiplexers combine lines from several stations into the long-distance lines. The terminals operate asynchronously with a poll/select protocol and were designed specifically for the Mobil operation.

One of the advantages of the Tandem system is that processing power can be added, removed and rearranged without reprogramming the system or the application software. As more service stations are put on-line, additional processor modules can be added to the system. "We can start small and expand as we go," Rowerdink explained.

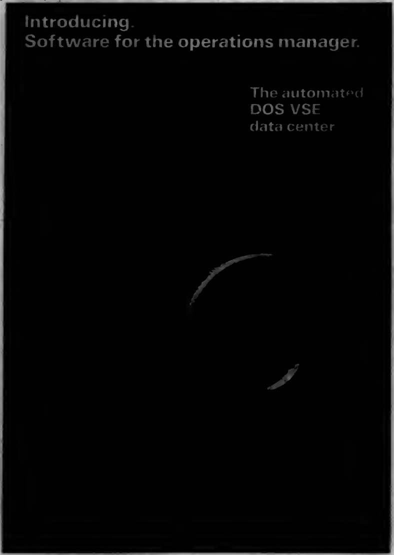
Mobil is currently implementing the system in service stations on the West Coast and in Arizona, Florida, Maryland, Virginia, Texas and the Northeast.

The company has also initiated another service for its customers based on the Tandem system: a debit card service that allows customers to use automated teller machine (ATM) cards to buy gas at Mobil stations. The service is now available in the Washington, D.C., metropolitan area. Mobil is in the process of bringing the service to its California stations, Rowerdink said.

The ATM service operates in a fashion similar to the credit card service. When a customer uses an ATM card to buy gas, the attendant runs the card through the POS terminal. Customers enter their personal identification number (PIN) code. Once the ATM card number, PIN code and all purchase information have been entered, the POS terminal transmits the information to the Tandem system, which sends the data to the bank. The amount of the purchase is then automatically subtracted from the customer's account.

Since Mobil receives the payment for services immediately, the transaction qualifies as a cash payment, so customers are able to take advantage of Mobil's discount program for cash purchases.

Will Mobil continue to expand its network? Originally, the company planned to bring an additional 1,500 stations on-line, but Rowerdink said he was not sure the firm's planned second phase would materialize. Whether the company broadens the network will depend primarily on the cost savings the system brings to Mobil, he explained.



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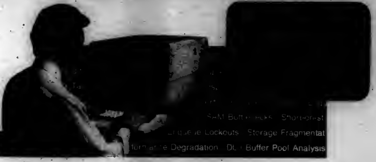

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A-367

Blue Cross reaps healthy gains with claims system

JACKSON, Miss. — By moving from a batch to an on-line claims system, Blue Cross and Blue Shield of Mississippi is achieving substantially higher productivity levels, according to Lon Larson, Blue Cross' director of system research and development.

Two years ago, the company began looking at a number of packages to replace a home-grown batch claims administration system (CAS) running on the company's Amdahl Corp. 580 Model 5850 mainframe with IBM's MVS operating system. "We needed on-line capabilities so we could process benefits quickly," Larson said.

Blue Cross narrowed the choice to three software packages. "We chose [System Development Corp.'s] CAS II, because it was able to process a number of claims under a multitude of benefit rules," Larson said. "It had the flexibility that we required."

Claims process control

CAS II is a benefit plan management and administration system that provides claims adjusters with control of the claims process. The system helps office personnel handle medical, dental, pharmaceutical, vision care and disability claims. It is specifically designed to aid in the containment of health care costs.

"Often, the benefits associated with claims involve basic hospital or professional services, major medical expenses and various endorsements," Larson said. "Before we went interactive, we had to pay complex claims in several steps.

"Now, with CAS II, all benefits for a claim are calculated automatically at one time. When our claims adjuster verifies the accuracy of the payment displayed on the VDT, it only takes the push of a button to pay the claim. This system is much more efficient than manual or batch processing."

For example, Larson said, a claims adjuster now typically handles and pays 125 to 150 claims per day. "This level is significantly higher than we are able to achieve with batch processing," he said. "This new productivity level was reached during the first stages of our integration of the CAS system into our operation. When we complete all phases of our planned conversion, the CAS II system will be administering the health-care benefit plans of nearly a half-million people in the state of Mississippi."

To help complete this integration, Blue Cross has been retraining its regional personnel. "When we started, the training took four weeks," Larson said. "We have cut that time in half.

At the end of the period, workers are given an on-line test. So far, our personnel has taken well to the system. There haven't been major complaints, and there have been numerous benefits."

Information center meet set

BOSTON — The first Information Center Conference and Exposition, sponsored by Warren and Weingarten Publications, is scheduled for Aug. 26-30 at the Hynes Auditorium and the neighboring Sheraton Boston Hotel here.

The conference is designed for information center managers in business, industry and government. Sixty sessions are planned, with topics such as end-user training, communications concepts and security protection.

Dr. Michael Hammer, president of Hammer and Co., and Dr. Larry Harris, president of Artificial Intelligence Corp., are the scheduled keynote speakers. Hammer plans to present a strategic view of corporate computing; Harris is scheduled to speak about artificial intelligence in the information center.

In addition to the speakers and sessions, 75 companies are expected to display their products, which include decision support software, networks and computer-based training.

Registration for the full conference costs $520, while admission to the exhibit hall is priced at $15.

Warren and Weingarten is located at 38 Chauncy St., Boston, Mass. 02111.

Conference to review bank trends

WASHINGTON, D.C. — Banking industry trends will be the focus of the 1984 American Bankers Association (ABA) National Bank Card Conference, to be held at the Washington Hilton here Sept. 9-12.

According to the sponsor, executives from Visa International, Inc. and Mastercard International, Inc. will be among the conference speakers. The conference will also feature a series of presentations entitled "Industry Trends," analyzing such issues as nonbank competition, point-of-sale programs, videotex systems and home banking and bank card fraud. The sessions will highlight major developments in banking.

Attendance at the 1984 ABA National Bank Card Conference costs $455 for ABA members and $595 for nonmembers. More information is available from Banker Education Network, Educational Services Department, c/o ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

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American Express stems rising costs with micro link

NEW YORK — In an effort to control the rising volume and cost of user-generated reports, the personnel and data processing departments at Shearson Lehman/American Express, Inc. two years ago began reviewing its mainframe Human Resource System (HRS) package to determine if a more user-friendly, cost-effective package could be found.

"Our department was being charged $25 to $100 for each report we needed," recalled Claire Lichack, manager for Shearson Lehman/American Express' HRS.

While the review found several powerful, easy to learn packages, Shearson Lehman/American Express determined that the existing package, from Information Science, Inc.'s Human Resource System, was best able to produce the kind of reports that the personnel department needed.

Rather than replace the mainframe package, the review recommended that Shearson Lehman/American Express use microcomputer programs to supplement the mainframe package.

The first steps in this project were taken in January 1983, as the corporate HRS department began to determine how the personnel department could use microcomputers. The personnel function at Shearson Lehman/American Express is decentralized, and 10 additional offices access the personnel system. The corporate HRS department acts as the liaison between the data processing department and the other groups.

Installation issues

Initial issues in implementing microcomputers consisted of selection of hardware to access the IBM 3083 mainframe, selection of software to manipulate personnel data, feasibility of downloading IBM mainframe data, impact of micros on data security and data validity and the cost considerations.

Microcomputers from both IBM and Apple Computer, Inc. were considered. The IBM Personal Computer was chosen for several reasons. From the start of the project, security was a major concern. Although dial-up access is convenient and allows users to work away from the office, it requires expensive dial-back security systems to control access.

Shearson Lehman/American Express decided to use a direct cable connection to the company's IBM Synchronous Data Link Control network to download data. IBM microcomputers supported this network; Apple's product did not support it.

Available software was another consideration. Shearson Lehman/American Express had determined that it needed a package that could support field, record and file sizes required for various applications; read downloaded files easily; produce graphics; create a wide range of report formats; perform calculations and statistical analysis; be learned quickly and easily; interface to other microcomputer software packages; and combine data from several files into a single report.

Additional, but not mandatory, features included built-in security features and better than average documentation and vendor support.

Information Builders, Inc.'s Focus was one of the mainframe packages that the committee had initially evaluated. Although the package met all user requirements, it needed extensive resources to create long, detailed reports. For production cost reasons, mainframe Focus was not a viable alternative. However, PC Focus eliminated these problems, and it was chosen as the primary application package.

Once the package was chosen, communications capability had to be established. Shearson Lehman/American Express was not sure that HRS files could be downloaded to PC Focus with its existing microcomputer to mainframe link, Technical Analysis Corp.'s Irma 3278 emulation package. A test file was successfully moved from the mainframe to the microcomputer.

A plan was then developed to provide users with HRS data by the first quarter of 1984. The steps included determining file layout and size requirements for each user, identifying hardware requirements, creating and testing the downloaded files, training users in PC Focus, providing support for both report generation and new application development and conducting demonstrations of PC Focus for the personnel end users.

Early in 1984, the training strategy was completed. Since security is a major concern, Shearson Lehman/American Express developed a user security awareness seminar using its corporate security services group. The goal of the program is to provide the end user with methods of dealing with security responsibility.

Shearson Lehman/American Express had initially projected a small number of potential PC Focus users. However, during February, Information Builders added a feature to PC Focus that allows users to create reports without using PC Focus coding. This code generator, called Tabletalk, is menu-driven and may result in a larger number of personnel users of PC Focus.

Today, Shearson Lehman/American Express uses PC Focus to create both reports and specialized personnel applications. "Using PC Focus, users can write reports that used to cost $25 to $100," Lichack said.

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CALENDAR

WEEK OF SEPT. 16

SEPTEMBER 18-19, WASHINGTON, D.C. — **Mortgage Banking Automation Workshop and Computer Expo.** Contact: Director of Registrations, Mortgage Bankers Association of America, 1125 15th St. N.W., Washington, D.C. 20005.

SEPTEMBER 18-21, SAN DIEGO — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Washington, D.C.

SEPTEMBER 18-22, JAKARTA, INDONESIA — **Business Indonesia — The International Business and Office Equipment Exhibition.** Contact: Elizabeth Sillars, Overseas Exhibition Services, 11 Manchester Square, London W1M 5AB England.

SEPTEMBER 19-20, UNIONDALE, N.Y. — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-25 in Los Angeles and Washington, D.C.

SEPTEMBER 19-20, NEW YORK — **The Association of Field Service Managers (AFSM) Future Trends in Service of Electronic Products Seminar.** Contact: Thomas M. Ross, AFSM, Suite B, 6237 Presidential Court, Fort Myers, Fla. 33907.

SEPTEMBER 19-21, PHILADELPHIA — **Networking & Data Communications for Personal Computers.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-26 in Costa Mesa, Calif.

SEPTEMBER 19-21, WASHINGTON, D.C. — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 19-21, ST. LOUIS — **Introduction to Vsam for OS/VS System Programmers.** Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63130.

SEPTEMBER 19-21, CALGARY, ALBERTA — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

SEPTEMBER 19-21, WASHINGTON, D.C. — **Computer Awareness: Basic Concepts, Capabilities and Terminology.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 19-28, PARIS — **The 35th Sicob, International Exhibition of Data Processing, Teleprocessing, Communication, Office Procedures and Office Systems.** Contact: International Trade Exhibitions in France, 8 W. 40 St., New York, N.Y. 10018.

SEPTEMBER 20-21, WASHINGTON, D.C. — **Power Systems for Computers and EDP Sites.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

SEPTEMBER 20-21, WASHINGTON, D.C. — **IMS/VS DB/DC Concepts.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

SEPTEMBER 20-21, CHICAGO — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Sept. 24-25 in Washington, D.C.

SEPTEMBER 20-21, NEW YORK — **Communications and Compatibility for Micros to Mainframes.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 20-21, WASHINGTON, D.C. — **Data Resource Management: Concepts, Guidelines**

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SEPTEMBER 22, NEW YORK — **Unix Systems Concepts and Facilities.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

SEPTEMBER 22, NEW YORK — **CICS Command-Level Programming I.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017. Also being held Sept. 29 in New York.

SEPTEMBER 22-23, NEW YORK — **CICS Command-Level Intensive.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held Sept. 29-30 in New York.

WEEK OF SEPT. 23

SEPTEMBER 24, NEW YORK — **Introduction to Data Communications.** Contact: Women in Data Processing, Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

SEPTEMBER 24-25, CHICAGO — **The First International Conference on Human Factors in the Work Environment and Computer Ergonomics.** Contact: Crispin Littlehales, Thomas L. Richmond, Inc., World Conference on Ergonomics, Suite 1800, 1350 Ave. of the Americas, New York, N.Y. 10019.

SEPTEMBER 24-25, ATLANTA — **Integrating Voice and Data in the PBX.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

SEPTEMBER 24-25, WASHINGTON, D.C. — **The National Conference on Government Regulation of Offshore Money Flow, Electronic Banking and Currency Reporting.** Contact: Office of Continuing Education and Conference, 4400 Massachusetts Ave. N.W., Washington, D.C. 20016.

SEPTEMBER 24-25, NEW YORK — **Local-Area Network/PBX Evaluation: A Planning and Decision-Making Perspective.** Contact: Data Communications, Special Projects Conference Management Center, 445 W. Main St., Wyckoff, N.J. 07481.

SEPTEMBER 24-26, NEW YORK — **Local-Area Network.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

SEPTEMBER 24-25, WASHINGTON, D.C. — **Multitenant Telecommunications Services.** Contact: Conference Registrar, Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

SEPTEMBER 24-25, WASHINGTON, D.C — **Digital Networking Technologies, Economics and Opportunities.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

SEPTEMBER 24-25, WASHINGTON, D.C. — **Introduction to Vsam.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

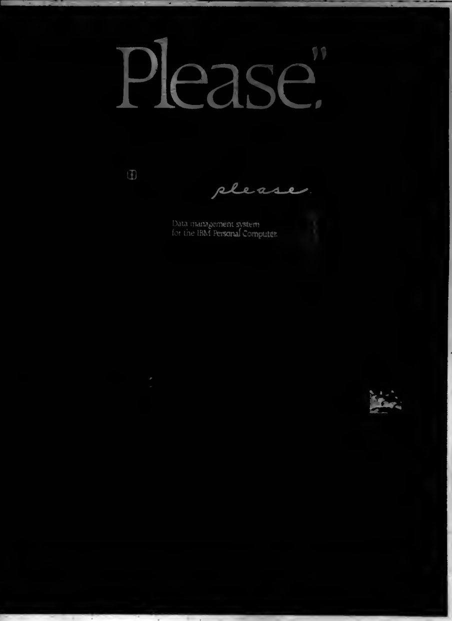
SEPTEMBER 24-26, CHICAGO — **Microcomputer Software Selection Workshop.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 24-26, HARTFORD, CONN. — **New Generation PBX.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

SEPTEMBER 24-26, NEW YORK — **Data Communications System Components.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

SEPTEMBER 24-26, ATLANTA — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-26 in Houston.

SEPTEMBER 24-28, DALLAS — **CICS Internal Architecture.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.



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EDITORIAL

Taking advantage of the breakup

The divestiture of AT&T, which looked good on paper, has left in its wake many users who are woefully understaffed and unable to deal effectively with the changes. Few have the manpower to capitalize on the new competitive environment. Options, however, are jelling. And it won't be too long before telecommunications managers replenish their bags of tricks and learn how best to play the players off each other to reap the full advantage of competition.

Take telecommunications services as an example. By now, most users have learned the new rules governing networking, but few have actually acted on any of the new options or reconfigured their networks to optimize them for cost.

Now is the time for study.

In particular, users should take a careful look at the use of long-distance carriers other than AT&T. This takes time. It is not, as some would imply, a simple matter to discern where these carriers will save you money. After all, AT&T is the only company with a ubiquitous network; the other carriers rely on this network to service areas where they don't have their own facilities.

Concerns over the quality of service given by the alternative long-distance carriers will be mostly allayed by equal access, a process that is scheduled to be completed within the next few years. Besides ensuring a higher grade of service, equal access will eliminate the need to dial long access and personal identification codes and will enable service access from rotary or pulse phones.

Another important cost-saving measure that users should study is network optimization. This finer cost-cutting measure may appear overwhelming, given other pressing concerns, but users should at least determine the parameters governing how additions will be made to the network. When there is less water behind the dam, the existing network can evolve slowly to comply with these guidelines.

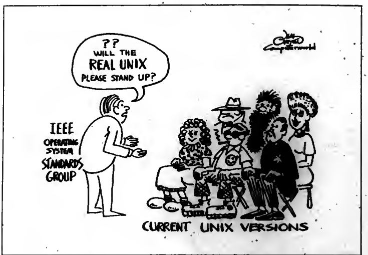
One of the primary concerns of network optimization is recognizing the effect of Local Access and Transport Areas (Lata) on operating costs. When the Bell system was segmented, Latas were formed to determine what traffic the local phone companies could carry and what traffic was fair game for long-distance carriers.

The local telephone companies are only allowed to carry traffic within the Latas in their jurisdictions. The long-distance carriers — AT&T, MCI Communications Corp. and the rest — provide service between Latas, interconnecting the Lata cells in a nationwide honeycomb.

Because of this, the rates for a circuit that remains within a Lata are often lower than the rates for a line that crosses over into an adjoining cell. It is to the user's advantage, then, to reduce the number of "contaminated" circuits he operates.

This can be done by containing network lines within Latas and tying them into a central hub. These hubs can then be interconnected, and the user's overall expense for inter-Lata circuits can be reduced.

This is only one of the earliest adjustments that will have to be made as the telecommunications environment stabilizes in the postdivestiture era. As time passes and the situation crystallizes, other cost-cutting techniques will be developed.



LETTER

Fifth generation: A note of caution

I would like to sound a note of caution and concern about fifth-generation software and software development and programmers. Management information systems directors should realize that no program is totally error free.

All system developments begin at step one. A team of experts gets together and implements a system. Because step one is taken by humans, it will have errors and bugs. Step two is created by the software of step one. Step three is created by the software of step two and so on. Although all systems from step two on have been generated by a machine, at some point a small bug or hidden flaw will grow out of the CPU and bite hard.

This poses two types of problems: One is philosophical; the other is operational. A philosophical flaw might be one that not even the team that created the step-one system could fix. An operational flaw might be a problem that could be fixed, but not quickly if the MIS department does not have programmers with the talents and skills needed to run tests and debug programs and systems. On-site expertise is very helpful to the end user, the site and the development center support staff.

MIS, DP and development center directors or higher management should not think that they can do away with talented programmers without paying for that decision at a later time and at a price many times higher than that needed to support the salaries of a talented and effective programming staff.

Jose Fernandez
Alexandria, Va.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

The pitfalls of not tempering one's DBMS enthusiasm

THE DATA CENTER
John P. Murray

This is the last in an eight-part series.

The introduction and continuing development of the data base management system (DBMS) within an organization are by no means a panacea.

There is no question that those organizations that select a well-designed, flexible DBMS — one that the vendor has made a commitment to continue to improve and actively support — will have made a significant contribution to their future well-being. If the appropriate plans are in place and the required high-level support is forthcoming, those organizations will have the ability to use information processing technology effectively to drive themselves ahead.

Organizations that find themselves in such a situation are in the minority. While there are any number of reasons for the failure to grasp the value of the DBMS and to make the commitment to move aggressively to a DBMS environment, the lack of appropriate vision, along with the concomitant willingness to accept reasonable risk, on the part of management information systems is an important factor. MIS management does, indeed, have a responsibility first to understand the value to the entire organization of developing a DBMS environment and then to move aggressively to develop that organization.

As the planning for the installation of the DBMS progresses and as more of the benefits of the installation of the DBMS become apparent, a real enthusiasm for the project begins to build in those organizations where the potential of the DBMS is understood and appreciated. In time a cadre, admittedly often a small cadre, of DBMS true believers will develop within MIS.

As the marketing effort that is used to sell the DBMS goes forward and as this group of true believers gains increased enthusiasm, that enthusiasm will begin to generate an increased hunger for the benefits of the DBMS environment outside the confines of the MIS department. Some caution is warranted here: The DBMS sales effort must be tempered with reason. One area of activity that has caused all MIS departments difficulty has been the tendency to promise to deliver more, usually in less time, than can realistically be delivered. If we allow that to occur with the DBMS marketing effort, we engender future difficulty.

Therefore, when considering the issue of marketing the DBMS concept and its function within the organization, it is particularly important that euphoria about the benefits of the DBMS not be allowed to get out of hand.

It will occur, given a good DBMS and the existence of a sound DBMS plan, that as the DBMS environment develops, changes in the client areas will be dramatic. As those changes come about, it is important that MIS has carefully laid the groundwork so that the euphoria associated with those changes does not lead both the clients and perhaps some members of MIS to incorrect or unrealistic conclusions about what can be delivered and when. Given that situation, if the preliminary DBMS marketing effort is not carefully considered and presented, difficulty may arise at a later date.

While it is quite valid to outline the advantages to be gained from the DBMS, those advantages need to be discussed together with the constraints that will be encountered as the effort progresses.

Some of the positive and attainable aspects of the DBMS environment are accessibility of the organization's data to clients, the reduction of redundant data and the ability of MIS clients to gain increased control over their information processing needs.

The constraints vary with the particular installation, but some of the more universal issues are:

■ Data accessibility. Who owns the particular data elements, and who can use them?

■ Client freedoms. How much freedom will clients be allowed? Can they write their own programs? If so, is there a program size limitation?

■ Schedule considerations: What are the constraints on the size of programs to be processed by clients on the prime shift? How are programs that exceed these size limitations to be handled?

■ Responsibility for support. Who, if the clients write their own programs, has responsibility for the ongoing support of those programs? What happens when the program, written by the client and needed by senior management at 8 a.m., fails at 4 a.m. after running for several hours?

Consideration of these and other DBMS issues early in the development cycle is important. The development of a process that will be used to explain the issues to the MIS client community as explicitly as possible should be considered a mandatory adjunct to the DBMS marketing effort. This should be further enforced through the development of a set of data base policies and standards documentation.

I know: Standards and policy and documentation are not high-priority items in the typical MIS installation. But let me assure the doubters in our ranks: The sooner explicit data base policies and standards are in place and enforced, the better the entire DBMS effort will be.

Perhaps this might be described as a negative marketing approach, but it is necessary to strike a reasonable balance in the DBMS environment between opening up the data resource and maintaining adequate control.

There is no question that the movement to a DBMS environment is inevitable. The longer organizations wait, the more massive the task will be. In some organizations, that task will be monumental, but competitive pressure will force organizations to make the move to the DBMS environment.

The time to begin to build the DBMS environment is now. The task is not easy. It will not move swiftly. But it can, with good management and a strong commitment, be very successful.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Me and my kneetop (a Mesoamerican odyssey)

HUMAN CONNECTION
Jack Stone

Se tu finis. Would you believe I dragged one hearty Radio Shack Corp. TRS-80 Model 100 3.9 pounder all across Mesoamerica, subjecting it to the worst of environments. We team-computed through the sun-drenched beaches of Los Cabos, the insect hordes of the Yucatan, the hideous humidity of Merida, the unending rains of San Christobal and the unbreathable smog of Mexico City — plus 15 air flights, five long-distance bus rides and one trip by rental car. Remarkably, the machine never failed to operate.

Of course, operability is one matter and functionality another. As I noted last week, you don't have a whole heck of a lot of compute power to work with here, although I'm quick to point out that one shouldn't really expect an IBM 3033 capability when one shells out a mere $599 for the base unit plus $49 for Radio Shack's new cassette drive. On the other hand, I must further declare that the machine's announced 8K bytes of random-access memory (RAM) is bad enough, but when the control program grabs off so much that you're left with exactly 5062 RAM bytes to play with, that's really base. Then again, on the positive side, the machine was so small that I was able to sneak it through three customs agents and a slew of X-ray checkpoints at airline terminals with nary a raised eyebrow from government officials.

But its practicality? Another subject altogether.

After many agonizing hours, I finally came up with a rating scheme to present a measurement of this factor on a totally scientific basis:

2 A unique environment — only a kneetop will do here.

1 Either a desktop or a kneetop will handle the computational need equally well.

0 The kneetop is not at all practical in this situation.

N/A The machine never got up to bat.

And now for the denouement of my recent research, some of the more interesting case studies in point:

■ Case I: Computing at 35,000 feet aboard Aeromexico Airlines, bound for Merida.

■ Rating: N/A

On my very first Mexican domestic flight, I whipped out the 100 and started revving up its word processing read-only memory with a little "Now is the time . . ." That was as far as I got because the flight attendant countered by whipping out the airline's safety card and revving it up in my face, emphasizing the text that read "No electrical devices shall be operated aboard."

■ Case 2: Same conditions as Case I, but aboard Ozark Airlines bound for Cedar Rapids, Iowa.

■ Rating: 0

Since my return, I had occasion to make the above-mentioned flight and proved, without a doubt, that kneetops aboard domestic U.S. flights are losers. I repeated the same test conditions as above, but this time the flight attendant responded with, "Coke or Seven-Up?," making no mention and taking no heed that I was operating a computer on board. In fact, no one paid any attention to me, the base unit or its handsome black carrying case — no questions, no raised eyebrows, no comments about how the other passengers wished their desktops were portable. I even pulled out the cassette drive and let it beep and gurgle along for a minute, but the only response was three yawns and a burp.

■ Case 3: Driving a crazy jungle road at high speed and crashing into a heavy truck, totaling my car.

■ Rating: 2

Blam! The car's windshield was wrapped around its bumper, and its left front fender shook hands with its carburetor. My companion and I came out of it with a few leg wounds, but the kneetop, though having smashed onto the floor, was unscathed.

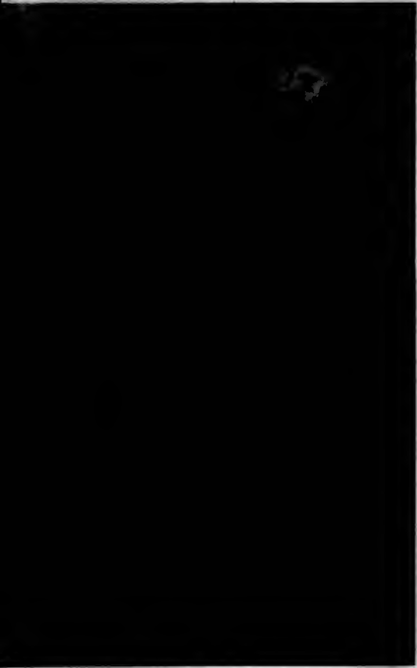
■ Case 4: Bus ride over a winding, spiraling road crossing the Sierra Madre mountains in southern Mexico.

■ Rating: 0

It is simply not feasible to use a kneetop when the sight of 7,000-foot cliffs as you approach hairpin turns (plus, no road barriers) causes your legs to wiggle and your hands to tremble uncontrollably. Plays the devil with key error rates.

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

THIS JOB CAN BE SAVED!



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VM
SOFTWARE INC.

1-CWX-0884

SOFTWARE & SERVICES

IBM offers Lisp on VM systems

IRVING, Texas — IBM has announced a version of the Lisp programming language for its VM operating system. Lisp is the most popular language for artificial intelligence applications.

Lisp/VM is an integrated, interactive environment that is said to provide a unified collection of Lisp programming tools. Both development and execution are supported in the same environment, IBM said.

The display-oriented system employs a structure editor that displays the structure of all Lisp objects, such as programs, data and results. A variety of debugging tools are provided. A user can observe a program as it is executing and dynamically specify the type of debugging information to be displayed as each syntactic unit is reached.

Lisp/VM statements can be intermixed with assembler statements, IBM said. In addition, consistent semantics for the interpreter and compiler make it possible to switch interpreted code and the same code compiled within a larger Lisp/VM program at any time during execution. This allows newly developed code to be included in existing production systems. Lisp/VM uses IBM's CMS file organization to support its library functions.

Error recovery featured

Error recovery features include the ability to interrupt and then resume execution of program loops in compiled and interpreted code. A full range of Lisp error-handling and exception primitives are also provided.

Supported data types include struc-

See LISP/VM page 68

SOFTLINE/THOMAS O'FLAHERTY

Staff development key to success

In previous Softline columns, O'Flaherty discussed the advantages of building an information systems staff based on trainees and the importance of developing an effective training strategy. In this article, he looks at training requirements and the likely effect of a training program on an organization.

The most important requirement for an effective training program is that there be a commitment to staff development and promotion from within. If this is not the case, then:

- Past and present trainees will have no assurance that there is a future for them with the company.
- Often, no desirable jobs will be available for internally grown staff. This will be a special problem for those in the "fast track."
- Trainees will have less loyalty to the firm.

To make promotions from within possible, information systems must have a reasonably precise projection of its personnel needs, including skill levels. This will be greatly facilitated by an inventory of present and planned skills in the staff.

Part of this commitment to internal development, ironically, will be shown in a propensity to use outside consultants to bridge personnel shortages. While proper planning will reduce the amount of such shortages, outside help will be needed for rush projects or when in-house skills are unavailable or cannot be developed in time. Consultants should be hired with the understanding that they will work themselves out of a job by educating current staff.

The point is sometimes made that hiring experienced outside staff brings new blood into an organization. In reality, middle-level hirings often do not bring in

See TRAINEES page 68

O'Flaherty is principal consultant and director of software programs at Input, Inc., a research and consulting firm in Saddle Brook, N.J. He is a regular contributor to Softline.

SOFTALK
Paul Gillin
CW Senior Editor

And a mainframe in every basement

I am looking for a micro-mainframe link. Not a real sophisticated one, you understand. Just something I can use to offload the burden on my CPU host.

It's not really that the host is under that much strain. To be honest, I bought an IBM 3083 because I was getting tired of poor response times on my personal computer. The salesman looked at me a little funny when I told him I wanted a home mainframe. But I look at it this way: Vendors have been talking about a mainframe on a desk for two years. I've got a mainframe in my basement. I'm just a little ahead of the game.

There are things you should be aware of if you, too, plan to pursue this course of action. IBM's MVS/XA can be a real job to support. I've had to buy some trundle beds for my systems programmers to use during those long nights at the terminals.

Operations are a bit of a pain. My basement tends to flood after a heavy rain, which sometimes has my operations manager climbing a wall. He also gets upset because he has to sleep in the basement with the computer. But be serious; uptime is important to me.

And this home mainframe stuff is expensive. All in all, I've invested about $500,000 in my software environment alone.

But just look at the benefits. Response times are down to nanoseconds. With 32M bytes of main memory, IBM's CICS and a bank of IBM 3705 controllers, I'm set to handle just about any on-line task that's put in front of me.

Heck, I've put my entire recipe file on Cullinet Software, Inc.'s IDMS already. There's a lot of overhead, sure, but I can track down a meatloaf in the blink of an

See HOME page 68

INSIDE

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IBM demonstrates AI research projects at conference

CW AT AAAI-84

By John Gallant
CW Staff

AUSTIN, Texas — What is IBM working on in the area of artificial intelligence?

The company gave visitors to the American Association of Artificial Intelligence National Conference on Artificial Intelligence (AAAI-84) held here recently an opportunity to see just what, as it demonstrated a number of its AI research projects.

The projects exhibited IBM's research and development efforts in areas such as expert systems, computer algebra and multimedia interfaces.

Perhaps the most sophisticated research effort demonstrated by the industry giant was the Yorktown Expert System for IBM MVS operators (YES/MVS), which was designed to manage a complex computer facility dynamically without the intervention of an operator. YES/MVS is currently being used experimentally at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., to control one large MVS-based computer system there.

For its 370 architecture machines, IBM demonstrated Prism, Scratchpad II and the Paris Scientific Center (PSC) Prolog system.

Prism — the Prototype Inference System — is an experimental system "shell" that is designed for use in constructing specific expert systems. Written in Pascal, Prism incorporates a set of procedures used to build applications, a so-called empty system into which users insert rules and inferences to construct expert systems.

Scratchpad II, a system and language in use within IBM facilities for seven years, contains facilities for symbolic mathematical computation. It was originally envisioned for use by novices for interactive solution of equations and by programmers to describe formally and manipulate algorithms and algebraic structures.

PSC Prolog, developed at IBM's Paris Scientific Center, is a version of the Prolog programming language. It interfaces with IBM's Lisp/VM product, the SQL/VM relational data base management system and the IBM CMS Command Executive Language. IBM has applied Prolog in natural language processing, data base representation and querying, expert systems and symbolic mathematical computation.

An IBM spokesman said the research projects were demonstrated to give visitors an idea of the directions the company is taking in AI. He would not say when, or if, the in-house projects will evolve into future IBM product offerings.

SYSTEMS SOFTWARE

COMPUTER ASSOCIATES INTERNATIONAL, INC.

CA-Dynam/CMS enhancements

Computer Associates International, Inc. has announced enhancements to its CA-Dynam/CMS file management product family, which is said to allow IBM OS/MVS, DOS/VSE and VM/CMS operating systems to share a common file management catalog.

Release 1.2 of CA-Dynam/CMS is said to enable an installation to back up automatically CMS-mode zero files or files that previously were considered privately owned by specific users.

Another enhancement is said to be the extended use of IBM's direct-access storage device Dump Restore program. This feature provides the ability to restore data even when the system is down.

Two other options, New and AS-OF MM/DD/YY, have been added to the restore commands to facilitate restoration of CMS files using data criteria, the vendor said.

A three-year lease costs between $3,000 and $7,000, depending on the enhancements chosen.

Computer Associates International, 125 Jericho Tnpk., Jericho, N.Y. 11753.

BUSINESS CONTROLS CORP.

Report Builders-1

Business Controls Corp. has announced the Report Builders-1 (RB-1) report writer for Digital Equipment Corp. VAX-11 and DEC Common Data Dictionary (CDD) users.

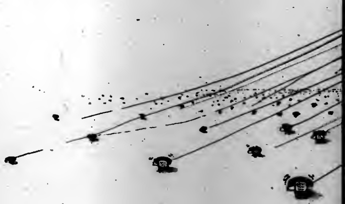
According to a spokesman, the RB-1 package is designed to allow users to produce common reports by drawing desired report layouts on terminals. It comes with self-teaching guides and an on-line Help facility.

The system is said to be fully integrated with DEC's CDD, and it generates fully structured VAX-11 native Cobol with a minimum amount of code required for specifications and screen painting. The package reportedly has no limitations on the number of files, control breaks, sort fields, page breaks, line breaks, subtotal and grand total fields, alternate keys, file types and user code that can be input.

The system's interactive user painting facility reportedly specifies the complete report format, including

Continued on page 63

WE HAVE TROUBLE LETTING GO.



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SOFTWARE & SERVICES

Continued from page 62

files, field sizes and editing.

The fee is $4,500 for the first CPU; $3,000 for each additional.

Business Controls, 3-7 W. First St., Clifton, N.J. 07011.

ADESSE CORP.
Enhancements

Adesse Corp. has announced enhancements to three of its products for the IBM VM operating system environment.

According to a spokesman, Release 1.3 of the VM Terminal Simulation Subsystem (TSS) provides two additional options to the system's Export command — From and For — that permit portions of disk files to be selected for transmission to an external system.

The Export command allows disk and spool files to be transmitted via TSS. Another added command, Query, allows the setting of all TSS options to be displayed, and the system's facility to simulate an IBM 3780 terminal using a binary synchronous communications line has been upgraded.

In addition, Adesse has announced the availability of Release 1.1 of its VM Online Performance Monitor (VMON). The release incorporates a variety of features, including support for IBM VM/SP Release 3 systems.

Also, alternate channel and control unit handling has been improved, and support for operation on Attached Processor, Multiprocessor and Dyadic systems has been added. VMON documentation has been enhanced to describe new and changed facilities.

Finally, Adesse announced that its VM/SP Extended Console Support program product has been made available for use with IBM's VM/SP Release 3.

The permanent-license fee for the VM Terminal Simulations Subsystem is $6,300 or $240/mo. VMON is $5,500, or $305/mo, and VM/SP Extended Console Support is $7,400, or $335/mo.

Adesse, P.O. Box 607, Ridgefield, Conn. 06877.

INTEGRITY SOLUTIONS, INC.
Data Recovery System Enhancement

Integrity Solutions, Inc. has released a new version of its forward file recovery software for IBM's MVS, MVS/XA and DOS/VSE operating systems.

The Data Recovery System recovers records or data sets lost due to system or program malfunctions, head crashes or operator errors.

The Data Recovery System enhancement provides an update function that offers the ability to apply journal records directly to an IBM Vsam user file.

Also, sequential disk and file concatenation has been added for greater flexibility for DOS/VSE users.

A perpetual license for the Data Recovery System is $25,000 for MVS and VS1 users and $12,000 for DOS/VSE users.

Integrity Solutions, 6470 S. Quebec St., Greenwood Executive Park, Englewood, Colo. 80111.

LIST PROCESSING CO.
LPCUT

List Processing Co. has announced a utility program that performs general file processing under IBM's OS/MVS, OS/VM, OS/VS and OS/XA operating systems.

LPCUT is a stand-alone, parameter-driven module that gives a choice of output and can create up to nine output records for each input record.

LPCUT can be used to select records for processing, copy literals and input to any location and convert them into a form the user chooses, as well as insert sequence numbers and literals into output records.

LPCUT is available under a perpetual license agreement for $995.

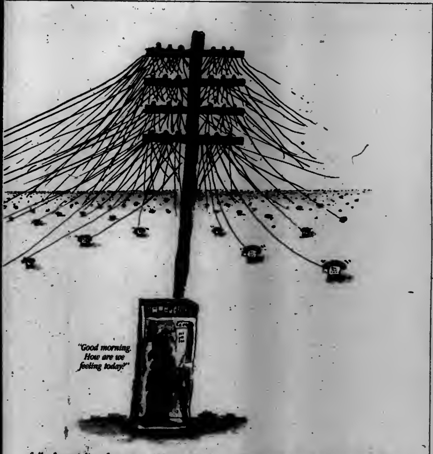
List Processing, 555 Waters Edge, Lombard, Ill. 60148.

COMMUNICATIONS RESEARCH GROUP, INC.
Blast

Communications Research Group, Inc. has released communications software for Digital Equipment Corp.'s PDP-11 series computers running under DEC's RSX operating system.

Blast will transfer any binary data files, text files or commands among RSX systems and any of 70 other micro, mini and mainframe computers

Continued on page 64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Continued from page 63

running Blast, regardless of operating system, the vendor claimed.

A virtual file format translates operating system file formats among the different operating systems. Blast uses techniques similar to synchronous protocols, including sliding window techniques, to maintain communications over noisy phone lines, networks and satellite links.

Blast for PDP-11 under RSX is available for $695.

Communications Research Group, 5939 Jefferson Highway, Baton Rouge, La. 70809.

ORION SOFTWARE, INC.
Telex Communication Module

Orion Software, Inc. has announced a module for its Network Orion communications program that reportedly connects IBM System/38 computers to the domestic and international telex network.

The Telex Communication Module is said to enable users to create, transmit, receive, file, redistribute and manage telex messages. Messages can be entered into a screen, picked up from the spool file or retrieved from an archive or standard text file for addressing to a telex number. Frequently used telex addresses can be stored and automatically retrieved by reference to a user-defined address.

The module transmits into the telex network through ITT's Databridge facility that accepts high-speed transmission at 2,400 or 4,800 bit/sec.

This facility reportedly means that bisynchronous communications can be established between the System/38 and the telex network without the need for a protocol converter box.

As a stand-alone messaging facility, the module is licensed for $3,600 to $4,200.

Orion Software, 222 Third St., Cambridge, Mass. 02142.

KREY SODERBERG ASSOCIATES, INC.
Passfree/3000

Krey Soderberg Associates, Inc. has announced an end-user interface for applications on Hewlett-Packard Co.'s HP 3000 computers.

Passfree/3000 is composed of three integrated subsystems: a menu-processing facility, security systems and job stream customizer.

The license fee is $2,500. Multi-CPU licenses are also available.

Krey Soderberg Associates, 1 Depot Plaza, Mamaroneck, N.Y. 10543.

ARKANSAS SYSTEMS, INC.
Baby/34 conversion service

Arkansas Systems, Inc. has announced a conversion service to migrate computer programs from the IBM System/34 or System/36 to the IBM Personal Computer XT.

IBM's RPG II and data file utility code, as well as operator control language, is translated to the IBM Personal Computer XT for use with the Baby/34 product.

The firm provides hardware and software to integrate personal computers using Baby/34 into a distributed network using various protocols. Baby/34 allows the IBM Personal Computer XT to act like a 3780 remote batch terminal.

It also permits bisynchronous 3270 terminals to hook up to the IBM 30 series, according to the vendor spokesman.

Charges are negotiated based on the number of programs to be converted and their complexity.

Arkansas Systems, Suite 201, 8901 Kanis Road, Little Rock, Ark. 72205.

APPLICATION PACKAGES

THE MEGA GROUP, INC.
Enhanced Megacalc

nounced an upgraded version of its Megacalc electronic spreadsheet program for IBM mainframes.

Megacalc is said to provide menu-driven access to existing non-Megacalc data bases, automatic uploading and downloading of popular microcomputer spreadsheets to and from Megacalc and expanded on-line Help documentation.

Other improvements are said to include enhanced printing capabilities, reduced loading times and memory requirements, more mathematical functions, more error and informational messages and an expanded spreadsheet applications library.

Megacalc now provides support for IBM's MVS/XA. The program is primarily used in IBM's TSO operating environment on such systems as IBM's 370, 4300 and 30 series.

Prices range from $15,000 to $19,000, depending on the size of the system. The program also can be leased for $400 a month.

The Mega Group, 17701 Mitchell Ave., North Irvine, Calif. 92714.

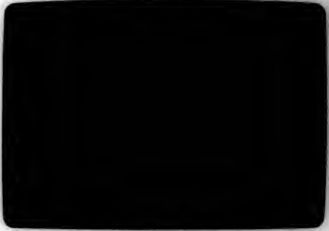
COMPUTERVISION CORP.
MWS 3400

Computervision Corp. recently announced that it will market worldwide the Medusa computer-aided design and manufacturing software in a fully configured and packaged system.

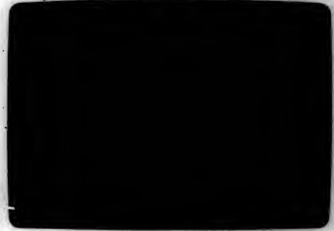
The company also announced workstations to support Medusa, the integrated software system for two-dimensional design, drafting and dimensioning and three-dimensional solid modeling, developed by Cambridge Interactive Systems Ltd., a Computervision company.

The Medusa Workstation Series 3400 (MWS) incorporates Motorola, Inc. 68010, 32-bit microprocessor technology and a Unix operating system.

See PACK page 65



An average terminal gets this far in 1.4 seconds. You'll twiddle your thumbs for 14 seconds before it's finished.



New HiSCAN terminals complete the entire drawing in just over one second.

Graphics terminals with ten times the drawing speed. $2,195 Monochrome, $2,995 Color.

Stop watch courtesy of [illegible] Electronic Corp.

PACK from page 64

The package is available in several different configurations and includes the Medusa software, Digital Equipment Corp.'s VAX-11 computers, MWS 3400 workstations, the MWS Shared Resource Manager and peripherals. The company is reportedly also selling the Medusa software and workstations as add-ons to existing VAX-11 installations.

Cost of the basic system, which includes a VAX-11/750, six MWS 3410 workstations and a license for standard Medusa software, is $460,000.

Medusa software for existing higher and VAX-11 installations ranges from $10,000 to $15,000 per workstation. MWS workstations cost from $36,000 to $47,000.

Computervision, 100 Crosby Drive, Bedford, Mass. 01730.

DATATREND, INC.
Datacalc Version 3

Datatrend, Inc. has announced Version 3 of its Datacalc spreadsheet package for the Digital Equipment Corp. VAX-11 superminicomputer running under DEC's VMS operating system.

A significant portion of the new version has been written in VAX Native Mode assembly language. Some other features of Version 3 include an index of saved spreadsheets, a sort and move ability, a consolidation feature, an on-line help capability and a global find and replace.

New functions and display formats include hidden columns, floating dollar display, table look-up, weighted average and loan payment calculation.

Datacalc Version 3 is priced at $1,795, the vendor said.

Datatrend, 395 Ironwood Drive, Salt Lake City, Utah 84115.

ACCESS TECHNOLOGY, INC.
Supercomp-Twenty for Digital Equipment Corp. systems

Access Technology, Inc. has announced that its Supercomp-Twenty spreadsheet modeling software package will be distributed by Digital Equipment Corp. on the company's PDP-11 minicomputers running DEC's RSX-11M+ operating system, DEC VAX-11 systems under DEC's VMS and DEC Micro PDP-11s running RSX. The package is already offered for the DEC Professional series.

Cost of the Supercomp-Twenty spreadsheet begins at $395.

Access Technology, 6 Pleasant St., S. Natick, Mass. 01760.

DECIMUS CORP.
V.I.P. 34/36

Decimus Corp., a Bankamerica Corp. subsidiary, has announced an in-house data processing system for small and mid-size financial institutions that run the IBM System/34 or 36.

V.I.P. 34/36 uses proprietary software that features parameter-driven menus, a common name and address file and customization options for institutions with special needs.

Applications for V.I.P. 34/36 include deposit systems, loan systems, financial reporting (general ledger) systems and subsidiary systems.

The price is $55,000, with an optional monthly maintenance fee of $600/mo.

Decimus, 3737 N. Main St., Walnut Creek, Calif. 94596.

ARTIFICIAL INTELLIGENCE CORP.
Intellect and interface

Artificial Intelligence Corp. has announced a joint marketing agreement with Tesseract Corp. Artificial Intelligence Corp. will provide its Intellect query language, and Tesseract will supply an interface to its Personal Management Software (PMS) system. These products are designed for PMS users to run on the IBM 4300 series and up, running under IBM's VM and MVS operating systems.

The interface, called Lexicon, is comprised of words, concepts and operational characteristics that apply to the Tesseract PMS data base. By using Intellect with the Lexicon interface, personnel professionals can access the data base in simple English, according to the vendor.

This special version of Intellect and its Tesseract Lexicon interface are priced at $25,000.

Artificial Intelligence, 100 Fifth Ave., Waltham, Mass. 02254.

COLLIER-JACKSON, INC.
CJ/Payroll Version 2.8

Collier-Jackson, Inc. has announced a version of its payroll processing and reporting package. CJ/Payroll Version 2.8 runs on Hewlett-Packard Co.'s HP 3000 series and on Digital Equipment Corp.'s VAX-11 series of computers.

The new version adds capabilities to accommodate payroll calculation needs, such as the accrual of sick leave and vacation, worker's compensation and all employee deductions and benefits, a spokesman said. Calculation methods can involve multiple mathematical functions and use several items of information for the calculation, according to the vendor.

The license fee is $16,000.

Collier-Jackson, 3707 W. Cherry St., Tampa, Fla. 33607.

SYSTAR CORP.
Systar

Systar Corp. has announced a software interface for the airline industry and other Programmed Airline Reservation System (Pars) users.

According to the vendor, the Systar interface is said to enable the use of multifunctional IBM 3101-834 and IBM Personal Computer terminals for on-line communications to reservation systems.

The price is $19,000.

Systar, Suite 208, 1762 Technology Drive, San Jose, Calif. 95110.

"One, one thousand. . . done!"

Our new graphics co-processor technology gives you a faster draw than anything under $10,000. It's ten times as fast as others in its price range. A hundred times as fast as the slowest terminals.

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HOME from page 61

eye. My checkbook is a model of organization. I've even put up a few spreadsheet models for stock investments using Execucom, Inc.'s IFPS. Now all I need are some stocks.

My neighbors, of course, wanted to get into the act. So I let them. The guy next door is now running some of his business files under my Management Science America, Inc. general ledger. He runs a small bakery and has been really impressed by the subsecond response times.

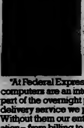
The lady down the street has got her entire inventory of sewing items in my material requirements planning package. No more searching through old wicker baskets for her.

The neighborhood bookie keeps track of the pro football odds on my decision support system. He saves a bundle of money too.

Only one thing is bothering me. My application backlog seems to be growing. I still haven't put up the inventory package for the fruit stand across the street. My mailman is bugging me for his address file data base. And the kid next door is going to break my windows if I don't start on his baseball card management application within a week.

So that's why I'm in the market for a micro-mainframe link. With any luck, I can offload some application development to a couple of contract programmers, consolidate the code on the mainframe and free up CICS to handle some of the really intensive tasks, like that coupon management application I'm running for the lady down the block. I hope I don't have to buy more trundle beds, though. My operations manager will have a fit.

"Data Check Recovery earned its keep for the next hundred years with just one use."



Mark Neal, Systems Programmer for Federal Express in Memphis, TN

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"We took a hit on our Uninterruptible Power Supply, causing us to lose power to our computers. When power was restored, we found that there was an apparently unrecoverable error on our log data set. We couldn't bring up IMS completely, and there was some question about the integrity of our data base.

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Software Corporation of America

TRAINEES from page 61

many new ideas or critical attitudes. Organizations will find that their needs are far better met by the judicious use of capable consultants.

The cumulative effect of implementing a trainee-based approach is significant change in the DP organization. Some changes are:

- The amount and effect of planning will be increased.
- Training will be continuous, creating a more questioning organization that will try new approaches.
- There will be greater group consciousness.
- Morale, skill and energy levels will increase.
- Some longtime employees might have difficulty in making the adjustment. But trainees can have a therapeutic effect on the existing staff.
- The development and operations areas will be more integrated by the two-way flow of people. Although the operations department will have a higher turnover rate, most of it will be planned, and the staff will be more likely to remain within the department than to move outside the company.

The net impact will be to increase staff productivity by:

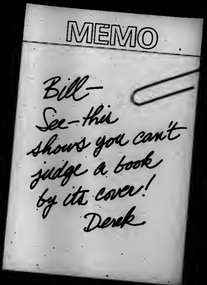
- Ensuring a constant supply of high-quality people.
- Increasing specific skills and providing a more global view of the firm's data processing mission.
- Reducing turnover at all levels, since the actions that will be attractive to trainees are the core of an effective personnel policy.

LISP/VM from page 61

tures, bit and string vectors, hash arrays, floating-point numbers, small and large integers, arrays of integers and arbitrary objects, pairs, lists and funargs.

Lisp/VM programs and data are accessed through the specialized Lispedit system editor or through IBM's Xedit. Lispedit provides a split-screen view in which the top portion of the display shows the Lisp expression under consideration and formatted in a manner appropriate to the language. The lower portion of the display shows the most recent user input and system messages.

Lisp/VM is offered for a one-time charge of $6,500 on IBM mainframes. It is available immediately from IBM, Department 68Y, P.O. Box 152750, Irving, Texas 75015.



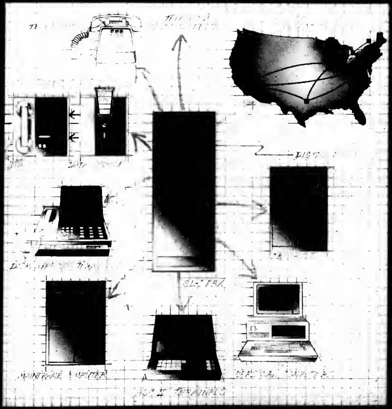
MEMO

Bill—
See—this
shows you can't
judge a book
by its cover!
Derek

The SL-1 system may look like voice from the outside...

call pickup
ring again
speed call
msg waiting
conf
call fwd
4274
4274
vol up
vo down
GHI 4
MNO 6
7
8
WXY 9
*
0
#
A.M.
P.M.
TIME
PLEASE CALL
WILL CALL AGAIN
RUSH
SPECIAL ATTENTION
MESSAGE
CALL BILL
SIGNED

but inside, it's all the dat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trans conf
speed call
msg waiting
conf 6
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4274
4274
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MNO 6
PRS 7
TUV 8
WXY 9
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0
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vol up
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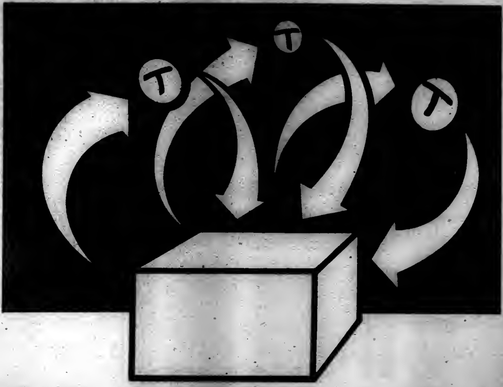


On-line in a Unix environment

Key in building a useful on-line information management system is allowing applications software, spreadsheet programs and word processors to access a transaction processing DBMS. By closely coupling data being continuously updated with the tools of the time-sharing system, the computer industry will be able to satisfy user demands for access. Unix provides the operating environment to do so.

By John R. Vrolyk, Mike Florio and Ken Lydell

The computer user of the 1980s will demand the complete integration of the data captured by transaction processing systems into the user-friendly applications of a time-sharing system.

Unix fits into this marketplace as the only viable standard that has the robustness to allow applications programmers to accomplish complex on-line tasks and the standardization of interface that allows the creation of user-friendly applications software.

Key in building a useful on-line information management system is allowing user-friendly applications software, spreadsheet programs and word processors to access the transaction processing data base management system (DBMS). It is only by providing a close coupling between the data being continuously updated by the on-line application and the tools of the time-sharing system that the computer industry will be able to satisfy the users' demand for access.

By providing a common operating system that can be successfully applied to both of these applications, Unix moves the industry one step closer to providing a solution to this important end-user requirement. The large number of DBMS packages available under Unix provide another step. The remaining step is the integration of applications with the DBMS to provide a user environment that meets the end user's expectations.

Just as there is a great deal of confusion with respect to appropriate terminology for describing various classes or kinds of computer systems, there is considerable confusion in defining classes of applications. On-line transaction processing is perhaps the least precise term commonly used.

> *Practical experience shows that the vast majority of transaction processing applications are of a noncritical nature. In other words, a few hours of downtime a year have little or no impact on the services an enterprise offers or its overall efficiency.*

Ultimate solution?

On-line transaction processing has been retailed as the ultimate solution to corporate information management. It supposedly contrasts dramatically with more traditional batch approaches. However, a careful examination of on-line transaction processing systems shows that they do exactly what traditional batch systems have accomplished for decades: automated clerical labor. The principal difference is in the speed with which automated clerical labor is reflected in the activities of the enterprise.

Transaction processing systems are typically dedicated applications that entail the entry and retrieval of fixed format, forms-oriented information. However, instead of punched cards and batch reports, there are page-mode terminals and ad hoc query capability. Even the term "transaction" defies rigorous definition. In fact, it is what it has always been, paper, batch or on-line: an arbitrary unit of clerical labor.

Given that both batch and on-line transaction processing differ primarily in the immediacy and availability of reliable data and that the types of data processed are substantially similar, it is clear that a significant range of on-line applications do not conform to this model. These include:

- Document preparation and transmittal.
- Electronic mail.
- Communications gateways to other application domains.
- Decision support systems.
- Record keeping.
- Interactive batch.
- Business graphics.
- Engineering/scientific applications.

In short, on-line transaction processing is a subset of on-line information management. An even smaller subset consists of those on-line transaction processing applications that are of such a critical nature that they require the enormous expense associated with fault-tolerant or redundant computers.

Practical experience shows that the vast majority of transaction processing applications are of a noncritical nature. In other words, a few hours of downtime a year have little or no impact on the services an enterprise offers or its overall efficiency.

Different requirements

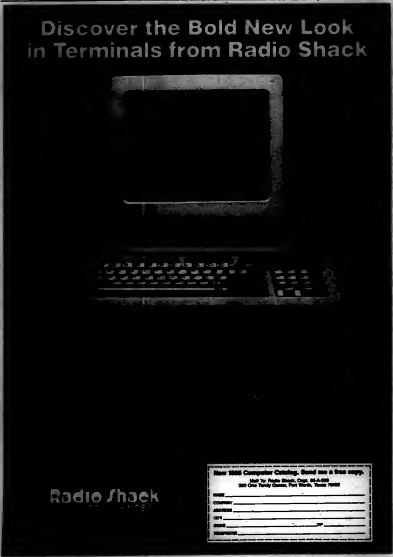
There are striking differences between the requirements of on-line transaction processing and other on-line information management systems. More generalized interactive applications usually require:

- Time-slicing.
- User-friendly generalized systems interfaces.
- Accounting software.
- Availability of a rich selection of third-party software.
- Several languages.

On-line transaction processing systems, on the other hand, typically require:

- Priority scheduling.
- Preventing casual or unplanned use.
- No accounting overhead.
- Custom applications.
- Cobol.

It is no wonder that computer installations attempting to achieve good response times and throughput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A careful examination of on-line transaction processing systems shows that they do exactly what traditional batch systems have done for decades: automated clerical labor.

are typically inhospitable to resource sharing in support of other on-line requirements. Simply running a batch report during a period of peak transaction rates in a high-volume application is sufficient, in many cases, to degrade system performance to the point where it adversely affects users.

Batch-oriented mainframes, on the other hand, tend to perform poorly both in time-sharing and on-line transaction processing applications. The typical two- to three-year backlog of applications typically provides an additional obstacle to departments seeking on-line information management services in support of local activities.

IMS products

Both the purveyors of batch-oriented mainframes and various fault-tolerant on-line transaction processing systems have consistently failed to provide integrated products that effectively support the broad range of interactive on-line applications.

Both large mainframe and dedicated on-line transaction processing environments provide few tools for the increasing number of corporate information users. The response has been to deploy a hodgepodge of micro and minicomputers using heterogeneous operating systems, communications protocols, applications tools and user interfaces. This jumble has created a nightmare for enterprises attempting to integrate resources through data communications or even migrate to larger and more capable systems.

A new generation of robust, modularly expandable, cost-effective systems that present a consistent interface to applications and users is required. These systems would provide a wide range of interactive services, including the processing of noncritical business transactions.

Mainframe batch systems would continue to host centralized corporate data bases and major batch and on-line transaction processing systems. Fault-tolerant vendors would provide expensive but needed solutions for those specialized applications where even a few minutes of downtime could have a bottom-line impact.

Personal computers

The future role of the personal computer may be less clear than forecasters would lead one to believe. Untold thousands of personal computers have been bootlegged into departments suffering from the lack of responsive on-line information management resources. Others have been procured in more legitimate fashion to provide multifunction workstations with specialized information management packages supporting various functions.

However, this remains an expensive alternative to appropriate departmental information systems based on supermicro or minicomputer technology.

It is clear that technology trends are in favor of highly intelligent workstations with significant local processing power. It remains to be seen whether or how the problems of data and application sharing can be solved without the presence of a more powerful system offering centralized data management, custom applications and communications to peripherals and remote systems and devices.

Users will want to provide a consistent set of tools for each echelon of the data management hierarchy. Unix offers the only practical solution to this problem.

From the IBM PC/IX to Amdahl Corp. mainframes and most systems in between, Unix is the only operating system that spans this range of

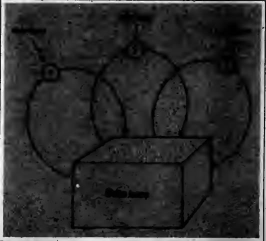

Figure 1. On-line transaction processing is the process of moving a data base from one consistent state to another by a number of users in parallel.

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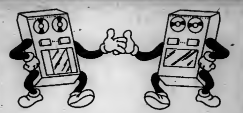

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power and capability.

Unix has provided the most widely used and generally accepted interactive time-sharing operating system but has historically offered weak support for on-line transaction processing. Fortunately, AT&T's entry into the commercial systems market seems to be accelerating the evolution of Unix into a full-function, business-oriented solution.

Problems corrected

Documentation, reliability and robustness have been largely addressed in System III and more completely in the System V release of Unix. However, many individuals unfamiliar with these recent changes regard Unix as suitable only for software development and document preparation. While this limitation was certainly true of Version 7 Unix and its ancestors, it is not true of Systems III and V.

Figure 2. The DBMS is used by both the user and the applications software. It accesses a common set of device drivers that are shared with the Unix System V operating system.

Major enhancements in concurrency control and interprocess communications have provided foundation tools for on-line transaction processing applications. With the full weight of a market-driven AT&T behind the product, it is reasonable to expect an accelerated rate of enhancements targeted at supporting on-line transaction processing.

The response to the ever-increasing capabilities of Unix has been large. Every major vendor in the computer industry now — or will in the near future — support a version of Unix on its hardware. Unix is the only non-IBM operating system provided by IBM on any of its products. Industry rumors suggest that IBM may even be considering Unix as its principal method of unifying its fragmented and incompatible line of minicomputers, perhaps going so far as to offer Unix as a guest operating system running under VM on its mainframe offerings.

Following years of pressure from the user community, even Digital Equipment Corp. has been forced to support its own version of Unix. This consolidation of effort on the Unix environment is unusual in the computer industry. Operating systems have typically served to establish a captive base of users dependent on proprietary features. At no other time has one been able to buy the same operating system from all of the major vendors of computer systems.

The strongest feature of Unix is that it provides a standard software interface to the operating system across a number of vendors' hardware and revisions of the operating system. This is the "system call" interface.

The Unix system calls have been consistent since the System III. Earlier versions of Unix had a different system call interface, and the user should be careful to examine which level of Unix an application runs under.

Complete language support

One of the strongest features of Unix is the number and quality of languages that are available to run under it. This flexibility allows the applications software developer to bring acrbss large pieces of software from the environment in which the code was orginally developed.

All of the major languages exist in the Unix environment. There are more than five versions of Cobol, six versions of Fortran and 10 varieties of Basic. Other languages include APL, RPG II, Lisp, Mumps and even a Nixdorf Computer Corp. Editor emulator.

In addition to the large family of languages that is available under

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> *In addition to the large family of languages that is available under Unix, there is a growing body of applications software that has been ported or developed for Unix.*

Unix, there is a rapidly growing body of applications software that has been ported or developed for Unix.

The advantages of hardware independence are seductive. Systems integrators can apply the most cost-effective technology available, and software houses can leverage their offerings across the widest range of hardware products. These advantages, combined with the acknowledged power of Unix as a software development environment, provide compelling incentives for various third parties to either port or develop attractive offerings for the Unix environment.

Data base integrity

A key feature of any on-line system is the ability to recover from catastrophic failure. This typically entails either rolling the data base forward from the last backup or using more sophisticated rollback techniques.

The objective is to get back on-line with a consistent data base without losing any transactions. An additional feature that is highly desirable is the ability to abort and back out transactions that have failed to be processed to completion due to an application error or some resource failure within the system.

There are a number of DBMS that provide this function in the Unix environment. It is important to note that this capability is not dependent upon the operating system, as it is in most proprietary environments. Rather, it is a function of the DBMS that is running under Unix. Once again, this frees the customer of a dependency upon one particular vendor for his hardware and operating system. It allows him to move his data base onto any system using the DBMS he selected.

Oracle Corp.'s Oracle DBMS, among others running on systems supporting Unix, provides full data integrity mechanisms as well as the emerging standard in query languages, IBM's SQL.

Multiple requests

A primary problem of the on-line transaction processing application, which does not enter into the typical batch environment, is managing multiple concurrent data base requests. These requests must be queued and serviced at an extremely rapid rate in an on-line system. This requires that multiple "threads," paths through the system and the DBMS, be provided to avoid bottlenecks.

The interprocess communications enhancements included in Unix System V allow on-line transaction processing application developers to implement modularly expandable applications that exploit the ability to package and distribute service entities.

About the author

John R. Vrolyk is president and a founder of Arete Systems Corp., a San Jose, Calif., manufacturer of on-line management information systems. Vrolyk was previously vice-president of marketing for Codata Systems Corp., the first company to introduce a Motorola, Inc. 68000-based multibus Unix system.

Mike Florio is president of /usr/group and vice-president of marketing at Palantir Corp., Sunnyvale, Calif. Ken Lydell is a product marketing manager for Arete Systems.

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IN DEPTH

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Can the software vendor deliver training?

By Richard Loewenstine

Is the vendor's training program simply "off-the-shelf" and perfunctory, or does the vendor provide a curriculum that was designed for your particular needs? Look for a training program that will take your people from where they are now to where you want them to be in the most efficient way possible.

Before you make a major investment in software, see if the vendor is willing to provide presales training to a group of your top people. This class will not only give you a closer look at the product you are considering, it will also provide insight into the vendor's ability to teach your people how to use the product.

If you are unable to invest time and resources in a class, ask the vendor for references from users of the product under consideration. In either case, keep the following questions in mind as you evaluate the competing software packages:

1. What is the vendor's commitment to education and training?

Some vendors have been forced into training, almost as an afterthought. If your vendor is willing to "throw in" training at no extra cost, it is unlikely that the training will have much value. Find out how long the vendor has been involved with training. Is the training and education division a profit center for the vendor's

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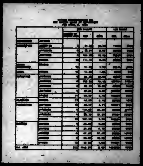

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organization? If so, it is clear that the vendor's users perceive value in the training provided and pay accordingly.

2. Does the training program meet the needs of the people who are using the product?

Is the vendor's training program simply "off-the-shelf" and perfunctory, or does the vendor provide a curriculum that was designed for your particular needs? Look for a training program that will take your people from where they are now to where you want them to be in the most efficient way possible.

3. What are the instructors' credentials?

Good software trainers should not only possess the experience and qualities of good teachers, they should also be highly trained in data processing and the particular products they present. The rapidly evolving changes in software technology and data processing methodology require instructors who have hands-on experience in the world outside the classroom. Look for a vendor who can provide instructors with the proper blend of teaching experience and DP know-how.

4. What kinds of training vehicles are used?

There is no substitute for workshop and/or hands-on training in software education. A certain amount of theory always has a place, but sooner or later people have to use the product. A quality software training program will emphasize small, intensive, hands-on workshops in which each person will be given individualized instruction.

5. Is there a meaningful curriculum plan?

Find out if the vendor takes a planned, building-block approach to the course curriculum. Complex software packages with multiple components cannot be taught in just one course. People have different levels of experience, and a "one-course-fits- all" approach can't possibly meet all individual needs. The best method is a series of courses, each building on those that came before.

6. How much training is included in the purchase price?

A continuing trend among software vendors is the unbundling of training from the price of the software. The purchase price will include a certain amount of training, but it is not realistic to expect the vendor to supply training for every possible contingency.

The technology will go through changes and enhancements over time, and your needs will expand and change as well. While most of the training you need will take place in the early stages of your use of the product, additional training will be necessary in the future. Changes in your department and staff will require that the vendor continue to supply training on an ongoing basis.

7. Will the training be conducted on-site or at the vendor's education center?

There are advantages to having training take place at your computer center. Travel costs are minimized, and you pay only for the instructors and materials needed. Another major advantage is having your people trained in the particular environment in which they will work when the software is put into production.

However, there are cases in which you will want people to get away from the distractions and day- to-day "emergencies" in your department. Look for a vendor who can give you a choice between on-site and regional education center training. You may opt for a combination of both environments.

8. Is the vendor using new training technologies?

Interactive audiovisual training programs and computer-based training methods will continue to expand in the years to come. Designed to supplement, not supplant, traditional teaching methods, these methods can be very effective. A user can watch a videotape, for example, stop it and then try what he has learned at a terminal. The training is still hands-on, but users can work at their own pace and learn a great deal in a relatively short time.

9. Can the vendor help you train end users?

The emergence of "user-friendly" decision support software packages is causing a shift in software education. In the not-so-distant past, the only people who used software were trained DP professionals. Today, software is used increasingly by end users with little or no DP background. Your vendor must be able to provide training that is flexible enough to meet the needs of both professionals and end users.

10. How will training affect your department?

The most important resource you have is your staff, and training is one of the best strategies for maximizing the investment in people. Given the shortage of, and demand for, qualified professionals, many DP departments have adopted a strategy of training their own people.

A vendor with a quality education program can be of great assistance in the ongoing effort to develop qualified personnel. Most people want to improve their skills and increase their value to their organization. The benefits to your department will include reduced turnover and related expenses, improved staff morale, increased productivity and reduced maintenance costs.

An investment in software and training is part of a long-term strategy. The software vendor you choose can help you realize this strategy through effective training. This kind of synergy will help you maximize your overall computing investment.

About the author

Richard Loewenstine is director of the Education Division of Cincom Systems, Inc., a Cincinnati-based software vendor.

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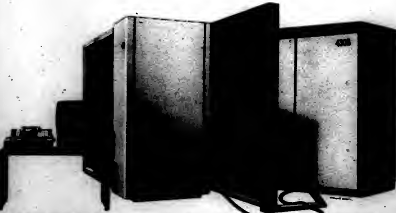

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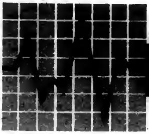


Performance Management

Tracking information systems

By Kenneth G. Rau

Through performance management, inefficiencies can be identified, and the results of corrective action can be tracked. Productivity improvements are possible: What organization would not welcome a 10% improvement in the productivity of a function accounting for 5% of revenues or 20% of operating cost?

An information system for the information systems department? What's so unusual about that? After all, if the information systems functions of the Fortune 50 companies were spun off as independent firms, most would make the Fortune 500 list. Yet few of these potential Fortune 500 companies and even fewer of their smaller counterparts — the information systems departments in other industrial firms, service organizations or public agencies — have anything resembling routine collection and reporting on the operational performance and trends of this vital organizational resource.

It is ironic that the function responsible for designing, installing and maintaining financial and performance reporting systems for the rest of the organization treats the capture and reporting of its own performance so casually — a classic case of no shoes for the cobbler's children.

Performance management is a control program that monitors in a formal and structured way the operation of an organizational function: in this case, the information systems function. Performance management ensures data is collected, analyzed and reported, a process that measures both whether information systems objectives are accomplished (effectiveness) and how well the department goes about accomplishing those objectives (efficiency).

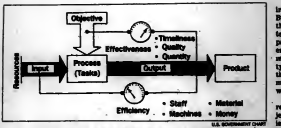
Conceptually speaking, information systems may be thought of as a process established by its parent organization to accomplish a set of objectives that results in the delivery of output — in this case, services. To accomplish these objectives, the parent organization allocates resources to information systems that are consumed in the process. Information systems metrics (performance measures), which indicate whether the services provided meet information systems objectives, are measures of effectiveness. Information systems metrics, which indicate how carefully allocated resources are expended in the process, are measures of efficiency. The conceptual model is shown in Figure 1 on ID/18.

Practically speaking, the results of a performance management program are the routine reporting of a selected set of metrics that describe whether and how well information systems is doing its job.

The information systems department of most manufacturing organizations consumes from 1% to as much as 5% of the revenue generated by the firm, depending on the industry and the firm's propensity to automate. In other enterprises, service organizations, public agencies, subsidiary ventures — particulary where information is an important component of the service — information systems accounts for 20% or more of the cost of doing business.

Productivity improvements

Through performance management, inefficiencies can be identified, and the results of corrective action can be tracked. Productivity improvements are possible: What organization would not welcome a 10% improvement in the productivity of a function accounting for 5% of revenues or 20% of operating cost?



U.S. GOVERNMENT CHART

Figure 1. Measurement of effectiveness and efficiency

Information systems is a service function. It exists to improve the effectiveness of a firm's line functions. Information systems projects are pursued and systems operated because they promise to deliver and do deliver benefits equal to several times their cost.

Benefits of 3-, 4- and 5:1 are not unusual; systems vital to maintaining a competitive edge are common. By improving on the effectiveness of the department to deliver such systems, as performance management promises, an organizational multiplier effect is realized. The performance management program's ability to improve the effectiveness of the information systems function is magnified for the organization as a whole as shown in Figure 2 on ID/20.

When David Norton and I first researched and wrote about this subject for the General Services Administration in 1976 and later published the results as a performance management implementation guide (Norton and Rau, *A Guide to EDP Performance Management*, QED Information Sciences, Inc., Wellesley, Mass.) we predicted rapid and widespread acceptance of this management control program. Users have not adopted this program for a number of reasons. Consider the following cases:

Case 1 — Large health maintenance organization. The first organization to attempt the design and installation of the performance management program could be characterised as enthusiastic but relatively new to the subject of management controls for information systems. Steering committees, project management and financial reporting had only recently been installed.

To install performance management, a data analysis study of the information systems function was performed. Resultant identified data items were grouped by information systems function and organized into a series of desired management reports. The newly installed management controls were the source for many of the necessary data items. Plans were developed to test and improve the quality of that data before incorporating it into the reports.

More than a year elapsed from the inception of the study to the production of the first meaningful performance reports. The first reports were significantly scaled back from those originally proposed as data quality tests indicated more work was needed before data captured by the supporting management controls could be included. As a result, performance management reporting was seen as an overly simplified report card and not as a management tool. As a report card, it quickly became politicised and was resisted.

Case 2 — Retail grocery chain. Following the installation of performance management in the health maintenance organization, a second organization initially approached performance management in the same way. As the data analysis study proceeded, it became apparent that there were extensive similarities in data needs between the two organizations. While not generic, it was possible to draw heavily on data classes and report areas identified in the first case and then tailor and modify these with the principals of the second organization in order to generate results more quickly.

Mock-up reports could be presented to information systems management in the grocery chain within a matter of months. This led to further tailoring before and after the production of live reports.

Necessary changes and enhancements to support management controls were viewed as a desirable byproduct of the study rather than a deterrent.

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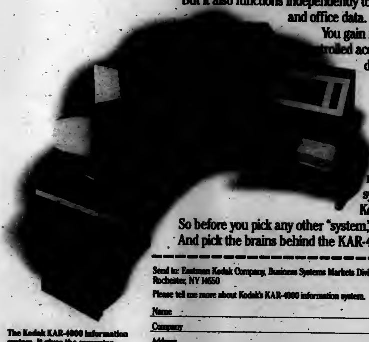

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Figure 2. Benefits of performance management system

Case 3 — *Local government data processing authority.* An ideal situation existed in the data processing authority of a local government agency. A solid base of supporting management controls, including time reporting, capacity management and operational charge-out, was in place. Picking up on the experience of the grocery chain, a basic performance management program was designed and installed in approximately three tailoring sessions.

Information systems management viewed the effort not as a new program, but rather as formalizing reporting efforts that had been unstructured and haphazard up to that point. Formalized performance reporting was quickly embraced as a useful discipline and management controls integration technique.

Case 4 — Financial institution. A financial institution recently installed a performance management program. Like the health maintenance organization, its management controls were newly installed and not yet stable.

Borrowing on the three previous cases, the fundamental reporting system was quickly installed through tailoring and modifying mock-ups. Many of the proposed reports were put on hold due to limitations of data in supporting management controls. However, heightened awareness of deficiencies in these controls has led management to introduce new or changed procedures. Plans are to install the remaining reports as constraints are alleviated.

In summary, several patterns emerged from these studies that prove to be the key. The first pattern is desired outputs (performance reports) clustered around four themes:

1. Financial management — Management of the dollar resources allocated to the information systems function.

2. Applications management — Control and reporting of the design, implementation and maintenance of application systems built and run by information systems.

3. Production/operations management — Ensuring availability and managing utilization of the computers.

4. Human resource management — Productivity of the personnel assigned to information systems.

These four areas reflect the principle resources being managed by information systems. By designing data collection efforts exclusively around these four resource areas, many problems are eliminated.

The second pattern shows that while performance management is an elegant control program concept, its practical implementation in a meaningful time frame suggests concentrating on performance reporting. Further, by concentrating even more narrowly on a limited set of monthly reports, it is possible to deliver a basic document in a period of months rather than years.

Finally, by focusing on a basic monthly document that tracks and reports on the four resources, refinement by the adopting organization is almost certain. By changing and expanding the document over time, the organization participates in its evolution. This leads to understanding and ownership, which do not result from cookbook approaches or elaborate externally designed programs.

Follow the resources

The benefits of practical performance management can be realized in a relatively short period of time by any information systems organization. The interested organization should start by developing an initial table of contents for the monthly performance report around the principal resources being managed by information systems.

Resource 1: Money or financial management reporting is often the best place to start. Data about information systems expenditures is universally available and frequently quite accurate. Unfortunately, the financial reports in most information systems organizations present results by object of expense, in other words, according to the parent organization's standard chart of accounts. This is probably the least useful way to view information systems expenditures. Information systems expenditures can be reported in at least four ways:

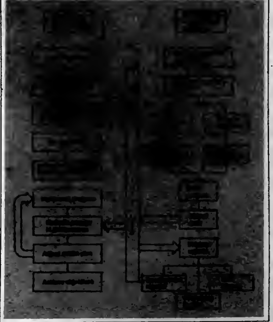
1. By object of expense — salaries, supplies, services, depreciation and occupancy.

2. By activity — development of new systems, maintenance of existing systems, production and operation of existing systems and administration.

3. By application — the cost to run, maintain and enhance the products of the information systems function.

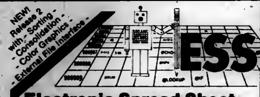
4. By customer — allocation of the entire information systems budget to parent organization functions supported.

Performance reporting of financial results should determine the types of expenditure reporting that



U.S. GOVERNMENT CHART

Figure 3. Performance management and management by objectives



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exist and the feasibility of reporting on other classifications of expense. Report formats for each feasible type of financial classification should be developed and an attempt made to populate these reports with data. The resultant report set constitutes a section of the performance report.

Resource 2: Application management involves the construction or acquisition of new systems and their addition to the inventory of computer applications software available to the organization. It is also concerned with maintaining and enhancing the resultant inventory. Application management performance reporting addresses:

- On-time/in-budget delivery of quality systems.
- Maintenance of the resulting corporate asset.
- Resource consumption and productivity in pursuit of these objectives.
- Trends in work loads and productivity.

Reports included in this section of the performance report include progress reports of major projects.

Reports of the applications management section of the performance report should also address application maintenance and the productivity of information systems personnel assigned to the application development and maintenance activity. The percent of time reported against authorized projects is a frequent measure of this latter activity.

Resource 3: Production management is the effective and efficient operation of information systems equipment, principally the computer and its associated components. Once a rather straightforward factory-like function, production resource management must now contend with such diverse subjects as systems software, telecommunications networks, data base management systems, distributed processors and attached micros. Each of these areas is more complex than the management problems that confronted the central computer facility of a few short years ago.

Resource management and measurement in this extensive division of information systems must address:

- Problem management.
- Availability management.
- Capacity management.
- Change control.
- Inventory management.
- Work flow management.
- Security management.
- Stability management.

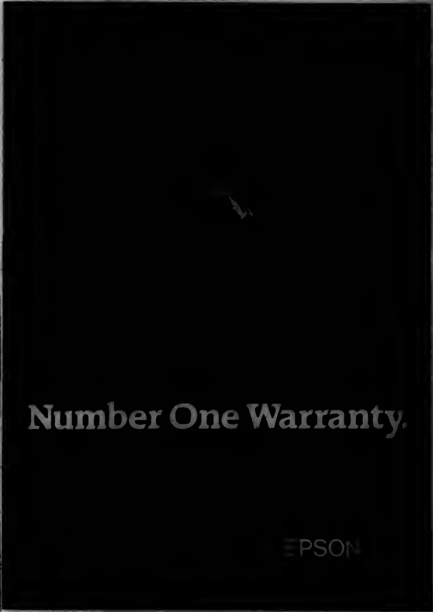
These management areas must be futher subdivided to arrive at fundamental organizational processes. However, they are a starting point for performance reporting in the production area. By identifying simple metrics for each area, basic performance reporting can be initiated on an architecturally sound foundation.

Resource 4: People are the most valuable, expensive and scarce information systems resource. Management of the human resource deserves extensive treatment in performance reporting. In addition to simple inventory-like tracking of this resource, practical performance management requires measuring human resource quality, productivity, availability and development. But just as with financial management, where few organizations do more than general ledger reporting, human resource reporting is generally confined to personnel inventorying — the least useful view.

Typically, human resource reporting in the absence of performance reporting demands is confined to head count plan, "month start," additions, deletions and "month end." Rows correspond to some aggregation of resources by title and/or level — not altogether worthless but certainly less than insightful. With the simple addition of skill level, development and training, this report can be made much more useful.

By correlating skill deficiencies and needs (found in personnel reviews) with training programs planned and completed, skill improvements may be measured. Skill improvements (in terms of task skills acquired) should then be integrated with human resource plans. Their effect on closing known skill gaps should be reported.

To measure quality and productivity of the human resource requires data on results. In the application development area, for example, this is accomplished by reporting on total project dollars expended, percent



overrun and on-time performance by project team or manager. When combined with total productive hours, a picture of quality and productivity begins to emerge.

Information systems organizations interested in installing a performance management program should start by defining the table of contents of a desired monthly performance report organized around the four information systems resources. A high-level summary document should be planned emphasizing one-page reports utilizing graphics and exception reporting.

The individual or team charged with implementing the program should involve all of the department's key personnel in the design efforts. A more important implementation tactic is the initiation and institutionalization of the monthly operations meeting.

This meeting involves the head of information systems and the information systems staff (direct reports). The monthly performance reports are presented by the staff members principally responsible for the resource and then discussed in general by the staff. Invariably, the discussion results in refinement and evolution of the report and successful implementation of the program.

Not all information systems organizations should consider installing a formal performance management program. As with all control programs, performance management was designed to enhance communication. In general, small information systems organizations do not suffer from communication problems that can be solved by formal programs, nor is the overhead of a performance management program affordable. Larger information systems organizations that are in start-up mode or lack the installation of basic controls have to attend to more important management considerations.

There are times in the evolution of an information systems organization when the implementation of a performance management program is more appropriate. The most frequent impetus for installing performance management is a perceived need to improve communication with senior or user management. This is an appropriate rationale, but in this case, "PR" often comes to mean public relations rather than performance reporting. Outside of this danger, improving external communication is the most frequent impetus for installing performance management.

The ideal time to install performance management is when frustration mounts over the lack of integration of existing controls (for example, system development methodology, chargeout, service-level management and data resource management). Performance management is an excellent integration vehicle in this case.

Common thread

"You can't manage what you can't measure," and that goes for the human resource as well as the other resources under the information systems purview. The common thread of recent books on the subject of management by objectives (MBO) is that MBO programs have failed in the past mostly because accomplishment of set objectives was not quantifiable.

No method of measurement was agreed upon or established by manager or participant. The marriage of performance management to MBO is natural and mutually reinforcing as depicted in Figure 3 on ID/20.

MBO sets three types of objectives: quantitative, qualitative and self-development. Performance management can provide data on the accomplishment of the first and third type directly. It often provides indirect input for the second type. More important, performance management can provide routine information on progress, as shown in Figure 3, which is critical to interim reviews of MBO programs.

MBO, on the other hand, provides performance management with demonstrable justification of its most important contribution — productivity improvement of the human resource.

About the author

Kenneth Rau is president of the Winchester Consulting Group, Woburn, Mass. He previously was a principal at Nolan, Norton and Co., where he did the original research on the Performance Management Program under contract to the General Services Administration.

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COMMUNICATIONS

A hidden benefit of T1 is its high-speed dial-up data

DATA STREAM
John Dix
CW Senior Editor

Putting aside the architectural arguments about the relative merits of integrating voice and data on the same network, a simple reality is that the increased use of high-speed digital communications facilities will encourage the combination for some uses.

AT&T and a number of other carriers offer digital services that operate at 1.54M bit/sec, now commonly known as a T1 link. Lower lease rates and increased availability of T1 facilities, coupled with the need created by the AT&T divestiture for better network management, has sparked a great deal of interest in T1 within the last year.

Using multiplexing equipment, customers can subdivide the high capacity of a T1 trunk into lower speed channels. A typical application is to use the facilities between private branch exchanges (PBX) located in separate branches of a large company.

When used between PBXs, the capacity of a T1 trunk is usually divided into 24 56K bit/sec channels. This essentially provides the user with 24 intercom channels between his remote locations at a lower cost than an equal number of dedicated private lines.

But the hidden advantage is that each of those 24 channels is also a high-speed, dial-up connection for data communications. Lee Goeller, president of Communication Resources, a telecommunications consulting firm in Haddonfield, N.J., said that establishing a link between two PBXs over one of these tie trunks allows a user to run end to end at 56K bit/sec.

"You're buying a voice channel, and you can run 56K bit/sec data over it, which used to require a carrier group of 12 voice channels," Goeller noted. "With speed calling [on the PBX], you can push one button and connect to a remote computer, dump the data and get off."

Goeller warned, however, that users cannot arbitrarily connect PBXs with T1 facilities, even if both are of the same generation. This is because not all PBXs use the same modulation schemes. Some use pulse code modulation, while others use delta modulation.

He also noted that concern over holding times associated with data — which might discourage some users from tapping the data capabilities of T1 facilities — are overblown. The theory goes that systems that are optimized for voice will degrade when carrying data, because typical business telephone conversations, which last roughly five minutes,

See TRUNK page 76

■ An on-line data base service containing U.S. Securities and Exchange Commission documents was introduced by SEC Online, Inc./70

■ A commercial digital satellite was launched to provide businesses in Europe with satellite-based switched data networking/70

■ Western Union Telegraph Co. has announced that it will market an electronic message service through retail outlets/74

INSIDE

Voice/Data Communications/74

Multiplexers/Modems/74

Products debut for Net/Plus Ethernet

WESTFORD, Mass. — Interlan, Inc. has announced a series of hardware and software product additions to its Net/Plus Ethernet family, compatible with Ethernet local-area networks.

The products include a series of intelligent boards to connect processors to Ethernet; an Ethernet connection and network protocol software for the IBM Personal Computer; and file transfer application software for Digital Equipment Corp. VAX-11, Unix-based computers and Microsoft Corp. MS-DOS-based computers.

According to the company, the products are targeted to system integrators, OEMs and large end users.

The Ethernet controllers, unlike the firm's earlier products, contain the higher levels of Xerox's Internet and Transport protocols, as well as the Department of Defense's Transmission Control and Internet Protocols. This is said to offload protocol processing activity from the host and reduce host overhead by 20% to 30%.

The boards feature 128K bytes of random-access memory, expandable to 256K bytes; a dedicated Intel Corp. 80186 microprocessor; 16K bytes of erasable programmable read-only memory; an intelligent direct-memory access interface; and an Intel 82586 Ethernet local-area network interface.

The boards are the NP100 for DEC Unibus systems running VAX/VMS or RSX-11M/M+; the NP200 for DEC Q-bus hosts running RSX-11M/M+; and NP300 for Intel Multibus machines running under Unix System V.

Also available is Interlan's Protocol Development Toolkit, for use in developing specialized transport or application-level protocols. The products are scheduled for deliveries in late 1984 and early 1985.

The NP100 costs $4,250, and the NP200 and NP300 are priced at $2,690. The Protocol Development Toolkit costs $2,000, while the 128K- to 256K-byte memory expansion option costs $400.

Interlan's personal computer connection is called Ethernet Direct Connect, a hardware and software package designed to give the IBM Personal Computer, IBM Personal Computer XT and Compaq Com-

See NET page 76

Steel firm taps into Boeing with SNA link

VIENNA, Va. — Boeing Computer Services, a division of Boeing Co., recently established a computer link with Bethlehem Steel Corp. to provide the steel firm with Systems Network Architecture (SNA) Interconnect Network Service.

Boeing has reportedly linked its nationwide data transmission network with Bethnet, Bethlehem Steel's SNA-based communications system, which serves Bethlehem Steel data centers in Pennsylvania, Maryland and Indiana.

According to Boeing spokesman George Feeney, the system allows Bethlehem Steel to complement its internal computing facilities with Boeing's business application software library and scientific Cyber/Cray Research, Inc. supercomputer-based services.

Bethlehem currently supports more than 6,000 terminals, and the SNA network is expected to increase productivity, Feeney said.

Single leased line

SNA Interconnect Service links the Bethlehem Steel network to Boeing's Mainstream remote computing services with a single leased line. No modifications to the current Bethnet configuration or additional equipment are required. A Boeing-developed software interface, or gateway, makes the interconnection possible, Feeney said.

According to Boeing, the software operates on NCR Comten, Inc. communications processors located in Boeing network control centers.

The gateway, the company reported, simplifies the communications link between Boeing and Bethlehem Steel SNA networks by reducing the number of path, route and cross-domain resource definitions necessary for proper operation.

The interconnect service also features rapid installation and extensive system security.

Boeing Computer Services is located at 7980 Gallows Court, Vienna, Va. 22180.

NCR Comten expands capabilities of IBM SNA-compatible modems

ST. PAUL, Minn. — NCR Comten, Inc. has announced expanded capabilities for its 7160 series of IBM Systems Network Architecture (SNA)-compatible diagnostic modems.

New features are said to include extended diagnostics, switched network backup, fanout, tail circuit and multiplexing. The enhancements have been made for four models — the 7164-0200, 7165-0100, 7164-0100 and 7165-0200.

The extended diagnostics feature is said to expand users' diagnostic capabilities with two remote modem tests: remote power loss indication and special tone test. Switched network backup enables modems on leased lines to be connected through a dial-up link if the dedicated line fails.

With the fanout feature, the vendor reported, users can connect up to four remote terminals to one remote modem. The tail circuit and data multiplexing features are said to reduce users' communication line costs when using 7165-0100 modems.

The features are available for purchase and one- or two-year leases.

The switched network backup and fanout features will not be available until fourth-quarter 1984, the vendor said.

Purchase prices are: extended diagnostics, $290; switched network backup, $340; fanout, $750; tail circuit, $50; and data multiplexing, $870, the vendor reported.

NCR Comten is located at 2700 Snelling Ave. N., St. Paul, Minn. 55113.

SBS seeking FCC OK on satellite access

Hopes to foil potential comptetitors by creating direct link

McLEAN, Va. — Satellite Business Systems (SBS) is seeking Federal Communications Commission approval to offer its telecommunications customers direct access to satellites operated by the International Telecommunications Satellite Organization (Intelsat) over the north Atlantic Ocean.

The SBS service would be considered part of the recently introduced Intelsat Business Service, which the international telecommunications organization is offering to thwart potential competitive satellite ventures that offer customers direct satellite links.

Direct links to Atlantic Ocean satellites would mean customers can avoid the current requirements to go through gateways at Etam, W. Va., Pittsburgh and Andover, Maine.

Interlink

SBS currently provides SBS Interlink, a service which connects international traffic originating in the U.S. via its own domestic satellite system or via terrestrial microwave links to the gateways.

According to SBS, the SBS proposal would establish originating or terminating links to 10 of its domestic earth stations now serving the Interlink service across the U.S. with Intelsat satellites. Interlink is a high-speed digital service with full- or part-time use.

SBS did not disclose the pricing of the new service, but said that charges for the Intelsat Business Service connection "are likely to be below existing services offering comparable quality."

SBS is a jointly owned company of Aetna Life & Casualty Co., IBM and Communications Satellite Corp. (CSC).

CSC has proposed selling its one-third interest to the other two partners.

French satellite to offer Europe networking base

French Direction Generale des Telecommunications recently announced the launch of the Telecom 1A satellite from French Guiana. This satellite will be used to provide businesses in Europe with satellite-based switched data networking, according to France Telecom, Inc., the U.S. subsidiary of the sponsor.

The satellite will service up to 300 earth stations throughout Western Europe with switched digital communications at rates from 2,400 bit/sec to 2M bit/sec with simultaneous transmission of voice, data and images, according to France Telecom.

The satellite has six transponders that operate in the Ku frequency band, the same used by domestic carrier Satellite Business Systems. All Telecom 1A transponders will be dedicated to business applications.

Service is scheduled to begin in October.

France Telecom is located at Rockefeller Center, 1270 Ave. of the Americas, New York, N.Y. 10020.

Data base holds SEC documents

NEW YORK — SEC Online, Inc. recently announced an on-line data base service that provides full-text copies of documents filed by public corporations with the U.S. Securities and Exchange Commission.

SEC Online reportedly stores several million pages of documents on optical laser disks and allows access via telephone lines.

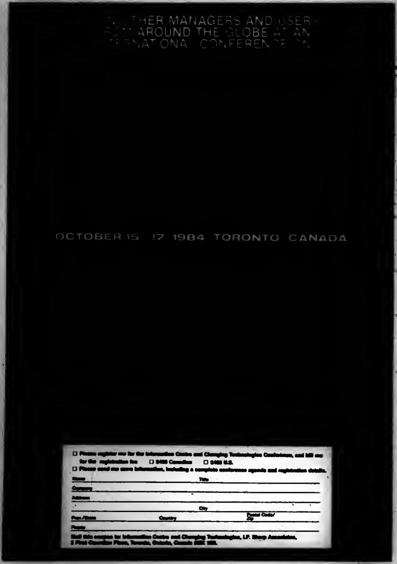
To access the service, customers need a microcomputer with a communications package or an 80-col standard terminal and a 103/212A-compatible modem.

The service allows callers to retrieve the title page of a document, scan single pages or entire documents, print copies of reports on their own printers, transfer copies of documents to their own diskettes or order an overnight copy from SEC Online.

Documents include SEC Form 10K annual reports, 10Q quarterly financial reports, 8K reports of unscheduled events and corporate changes, annual management reports to shareholders, proxy statements, registration statements, acquisition reports, company research files and publicity files.

User fees are $18/hour during prime time (8:30 a.m. to 6 p.m. EST) and $9/hour for nonprime time.

SEC Online is located at 200 E. 23rd St., New York, N.Y. 10010.



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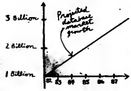
As more and more businesses rely on the immediate access to data bases for their success and growth, we are witnessing a veritable explosion in the database market. The Spring 1984 issue of the Directory of On-line Databases, compiled by CUADRA Associates, reports the addition of over 2,000 new database listings between 1979 and 1983. The list of databases spans the range from ABI/INFORM for use by business executives to the ZOOLOGICAL RECORD that provides worldwide coverage of zoological literature. According to Link Data Resources, what was a 1 billion dollar industry in 1982 is projected to triple in size by 1987.



The increased demands by business for databases have placed an ever increasing demand on the terminals that access that information.

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Digital's DECwriter Correspondent™ teleprinter has been so comprehensively engineered that it more than satisfies all these exacting requirements.

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Digital's Correspondent teleprinter features a bidirectional printhead which prints out a rapid-fire 150 characters per second for true 1200 baud performance. That's a full four times faster than what you can expect from any other portable teleprinter. All that speed means that you can save up to 75% on your dial-up phone line charges. And can save up to 75% on computer connect time as well.

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printer has been engineered with exactly that in mind.

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And it prints on plain paper, for increased legibility at a reduced cost.

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The Correspondent teleprinter offers you a printout versatility that does not lock you into any predetermined format.

You can set margins at the top, bottom, left and right, and choose from 132 horizontal and 168 vertical tabs to customize a printout for your specific requirements. Paragraphs of information can appear in column form. Or vice versa. You can also select 8 different character sizes, and print up to a remarkable 132 columns per line.

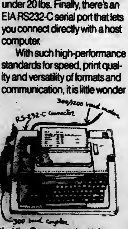
And the Correspondent teleprinter's command of the printed word doesn't stop there. There are 10 different national character sets built into it, as well as APL.

One other format is particularly helpful for presenting complex information in an easily understandable way. The Correspondent teleprinter prints bit map graphics for a high-impact visual presentation of charts, graphs and formulas.

CONDUCT DATABASE SEARCHES AT WORK, WHEREVER THAT MAY BE.

The Correspondent teleprinter's flexibility of formats is matched by its flexibility of communications options. A built-in 300/1200 baud modem lets you dial directly through the keyboard. With the modem, you can store 125 characters of your most frequently used phone numbers and dial them by simply hitting a single key. A built-in acoustic coupler can accommodate almost any phone, so you can access a database whether you're at home or on the road. And when you are on the road, you'll find the Correspondent teleprinter easy to take along. It's such a compact package that it takes up just about the same amount of space as an average typewriter and weighs under 20 lbs. Finally, there's an EIA RS232-C serial port that lets you connect directly with a host computer.

With such high-performance standards for speed, print quality and versatility of formats and communication, it is little wonder that the Correspondent teleprinter is held in high esteem by experts in the data search field. Jeff Pemberton, editor of ON-LINE, states, "I have been doing on-line searches since 1969, and the DECwriter Correspondent is certainly at the top of the list of the print terminals I have tried."



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Easylink offered in volume shipments

UPPER SADDLE RIVER, N.J. — Western Union Telegraph Co. has announced it has begun volume shipments of its Easylink Instant Mail Manager communications software.

The software is being marketed through retail dealers with Western Union's Easylink electronic communications service.

The service is designed to allow otherwise incompatible personal computers, word processors, terminals and mainframes to communicate via Western Union's Easylink message service.

According to the company, there are more than 70,000 Easylink users in the U.S. The software, which runs on IBM Personal Computers and compatibles, reportedly provides word processing, data base and disk file management and communications capability in an integrated package.

The software has a suggested retail price of $95, the vendor said.

Western Union is located at 1 Lake St., Upper Saddle River, N.J. 07458.

VOICE/DATA COMMUNICATIONS

MEGABIT COMMUNICATIONS, INC.
MBX-T101 channel extender

Megabit Communications, Inc. has announced a long-distance version of its IBM channel extender designed to handle block multiplexed channel communications at 1.54M bit/sec over distances of more than 25 miles.

The MBX-T101 is said to be transparent to host software and to allow for placement of plotters, high-speed laser printers and other peripherals. It is said to be compatible with T1 carrier digital communications circuits and with IBM systems software.

According to the vendor, on-site backup systems are provided at the time of sale. The MBX-T101, including a local unit, a remote unit and backups, is available within 60 days after receipt of order for $60,000.

Megabit Communications, 90 W. County Road C, St. Paul, Minn. 55117.

MULTIPLEXERS/ MODEMS

GANDALF DATA, INC.
LDM 409B

Gandalf Data, Inc. has announced an enhanced version of its LDM 409 metropolitan-area modem and a rack-mountable version.

The LDM 409B is a 9,600 bit/sec synchronous modem that includes dual-channel multiplexer capability, the vendor said. The unit is optimized to operate over four-wire voice-grade lines.

The LDM 409B includes all the features of and is compatible with the LDM 409. Enhancements are said to include an internal power supply in place of the wall-mount tranformer, an extended receiver sensitivity range, internal dip option switches and a dual-channel capability.

The price is $1,175.

A rack-mount, single-channel card version, the RM 3409, is also available, the vender said. Compatible with both LDM 409 models, this version occupies one slot of 14 in the vendor's LDS 3000 rack.

The price is $1,100.

Gandalf Data, 1019 S. Noel Ave., Wheeling, Ill. 60090.

ANDERSON JACOBSON, INC.
1212-AD2

Anderson Jacobson, Inc. has announced an autodial modem said to offer computer logon and security with password protection.

The 1212-AD2 is a multi-

Continued on page 76

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1,200 BPS Modem. Also available for 5 day delivery is the DTU 1200D, a 212A compatible full duplex dial modem. This 1,200/300 bps modem features automatic dialing, CRT prompts and automatic test capabilities and sells for $655 including freight and COD charges.

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VOL. I *1984*

The only way to lock in data, and lock out intruders, is to interlock hardware and software.

Hardware alone has never solved the problem of data insecurity. Neither has software alone.

Yet year in, year out, there's always a new solution based on one of the two. Few claim to be the ultimate solution. Each claims to be different. It's a seller's market. Let the Buyer beware.

Security paranoia

Let's face it: Anything important enough to put in a computer for fast analysis and retrieval is important enough to protect. Dishonest insiders—or worse, incompetent ones—will create chaos if you don't protect it. As will knowledgeable outsiders up to no good. When everybody is out to get you, paranoia is just good thinking.

And there are a variety of ways they can get you, too. There's scanning. Weaving through networks. Sending Trojan horse programs within electronic mail. Data diddling. And of course, trap doors, back doors and open doors.

Once in, there's all sorts of ways an ill-intentioned soul can cause havoc. Like browsing through records that are highly confidential. Data diddling with these records. Stealing them. Or just plain destroying them.

Old guard not working

As previously stated, there are many hardware and software solutions. Each gives some degree of protection. Each has drawbacks. Dial-back systems are costly and inconvenient. Password schemes tend to be too easy to defeat. By the same token, a dedicated file server is of no help when the elite passwords are discovered. Then there's encryption. Costly encryption. Confusing encryption.

Carrying any of these old-guard "solutions" to extremes can cause user rebellion—or even lock you out of the system.

The cavalry has arrived

It's not software. It's not hardware. But the synergism of both. Codercard™ has developed a device slightly larger than a credit card that contains a self-powered microprocessor, 128 bytes of RAM and 2K of ROM. Each card contains a unique ID, and a complex series of algorithms that are key to the authorization process.

Application is simple. The user just inserts the card into a base unit that connects to his terminal. The host computer then checks for ID validity. If the card is valid, the host starts the algorithm process. Both card and host must arrive at the same answer.

Since there are over 400 billion non-linear combinations possible, accidental discovery of the correct answer is quite a long shot. A 400-billion-to-1 long shot. And any attempt to compromise Codercard electronically, or by physically disassembling it, will render the card useless. Which quickly foils dedicated attempts by computer experts to discover the correct answer to the authorization process.

As you can see, Codercard has gone to great lengths to hack out the hacker. Key to this accomplishment is the successful interlocking of both hardware and software. Anything less is truly less. And anything less just isn't enough.

CODERCARD.
2902 Redhill, Suite 160, Costa Mesa, CA 92626
Telephone: (714) 662-7689

Continued from page 74

speed synchronous/asynchronous modem compatible with the AT&T 212A and 103/113 modems.

It is said to be capable of dialing a remote computer upon receipt of a code name instead of a telephone number and can be set up to dial only designated computers, refusing entry to people who do not know the passwords, the vendor said.

The modem stores up to 16 phone numbers of up to 37 digits each and can be used in either pulse or Touch-Tone dialing. Other features include automatic speed dialing and parity-code detection and manual keyboard dialing from terminal or automatic dialing from stored numbers, the vendor said.

The price is $695 a unit.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

RACAL-MILGO, INC.

Mark Series 48, 96 modems

Racal-Milgo, Inc. has introduced a line of 4,800 and 9,600 bit/sec modems compatible with the company's Omnimode and MPS modems.

The Mark Series 48 and 96 are said to be compatible with CCITT V.27 or V.29 modems for international applications. Both units have local and remote diagnostic loop-back testing with front-panel status indicators.

Custom MOS/LSI technology permits synchronous operations over unconditioned lines in either point-to-point or multidrop configurations, the vendor said.

Mark Series 48 modems sell for $1,500. The Mark Series 96 sells for $2,500.

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

COMDESIGN, INC.

TS-600

Comdesign, Inc. has introduced the TS-600, a statistical multiplexer that concentrates up to 32 data devices onto a single telephone line operating at speeds up to 19.2K bit/sec.

The TS-600, which provides switching and port contention capabilities, is said to enable attached devices to transmit at maximum speeds of 9,600 bit/sec. It reportedly provides compatibility with a variety of host computers from major manufacturers.

Users of the vendor's TC-500A device can purchase a module that will allow them to upgrade the equipment to the TS-600.

The TS-600 features a touch-key front panel, which is said to enable the user to set operating characteristics and monitor and test the data communications system. Statistics and diagnostic information appear on the equipment's built-in visual display and supervisory terminal.

Prices start at $3,100.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

MATH ASSOCIATES, INC.

Fiberlink XR-8000

Math Associates, Inc. has announced an eight-channel fiber-optic multiplexer designed to support full-duplex asynchronous data transmissions over distances up to three miles.

The Fiberlink XR-8000 reportedly enables eight RS-232 devices to operate at 9,600 bit/sec. It consists of an eight-channel multiplexed optical transmitter and a companion demultiplexed optical receiver mounted in a common enclosure.

Two units are needed for a full system, at a cost of $1,100 per unit.

Math Associates, 2900 Shames Drive, Westbury, N.Y. 11590.

NET from page 69

puter Corp. Compaq personal computers direct connections to an Ethernet/IEEE-802.3 local-area network. It is said to provide complete transport service to higher level applications running on a personal computer.

The product includes a plug-in Ethernet controller and MS-DOS networking software that together provide internet transport protocol capabilities. It was designed to provide communications between the Personal Computer and VAX-11, DEC PDP-11 and LSI-11 computers and Unix systems.

Scheduled for availability in September, the Ethernet Direct Connect costs $625 with an external Ethernet transceiver and $775 for one with an on-board Ethernet transceiver.

Interlan also announced file server software designed for transfers among incompatible computers.

The NS7400 series allows one or more computers on a network to act as a file server and transfers and accesses files throughout the network without regard for individual file structures or physical file location, according to the company.

The Network File Server will be available in November at $1,195 for VAX/VMS; $895 for a Motorola, Inc. 68000-based Unix System V; and $195 for an MS-DOS system.

Interlan is located at 3 Lyberty Way, Westford, Mass. 01886.

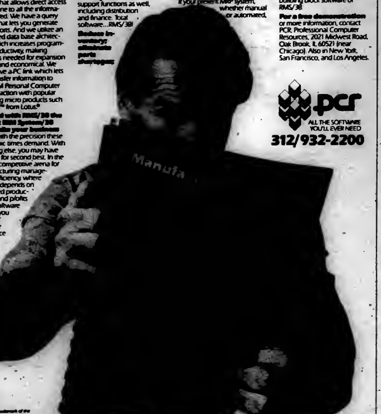
TRUNK from page 69

are much shorter than data sessions.

Goeller argued that average-use figures for data sessions are skewed because of the way computer time within organizations is charged back to user departments.

Traditionally, computer connect time has been cheap, he said, but computing time was expensive. So users would log into the computer to reserve a slot but only use it when they needed it. To combat that tendency, some companies reversed that, making connect time expensive and computing cheap.

"All of a sudden, the long holding times for data disappear," Goeller said.



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SYSTEMS & PERIPHERALS

HARD TALK
Tom Henkel
CW Senior Editor

IBM adapting to global market

There is much that remains to be seen on how the recent resolution of the IBM/European Economic Community (EEC) antitrust investigation will affect users of IBM mainframes. One thing is certain, however; the impact on the European user community will have an effect on U.S. users as well.

The most interesting, and most ambiguous, outcome of IBM's voluntary agreement to alter its business practices in Europe is the promise to release technical specifications, or interface information, on new 370-era products within four months after their announcement. The implication is that IBM will not announce mainframe products until it is certain those products can be delivered within four months.

With a worldwide army of consultants making a living watching IBM, even the most trivial rumors about IBM seem to sweep the globe in a matter of days. Consequently, if IBM abides by a four-month policy in Europe, it will have to do the same everywhere else it does business.

Before the EEC and IBM reached a compromise Aug. 2, the EEC was demanding that IBM release technical specifications on new products at the time of announcement. This demand had some European IBM users concerned that such a requirement would cause IBM to start making suprise product announcements that would give big system users little time to plan ahead. It is possible the four-month policy may also cut, though not as seriously, the time all IBM mainframe customers have for long-range planning.

Many industry analysts believe IBM has been steadily cutting the lag between product announcements and deliveries since last-minute technical problems on the IBM 3380 disk drive caused IBM a great deal of embarrassment several years ago. Consequently, domestic IBM watchers appear convinced that IBM's concession to the four-month policy was merely a public affirmation of an inter-

See IBM/EEC page 86

Amdahl breaks new ground with beta site installation

By Tom Henkel
CW Staff

DALLAS — In a move concerning what is believed by some industry analysts to be a pivotal processor for Amdahl Corp.'s viability as an IBM competitor, Amdahl broke with tradition in May when it installed its first processor under an early delivery, or beta site, program.

The processor, a 5870 with 32M bytes of main memory and 24 channels, was installed at Chilton Corp., a credit reporting firm here. After the first three months of use, the machine appears to be reliable and to offer at least 60% more processing power than Amdahl's earlier 5860 mainframe, according to Chilton's president, Dan Smith.

Prior to May, Amdahl had traditionally done all of its testing in-house before making first deliveries, Smith noted in a recent interview. Amdahl may have decided to change its strategy on system testing because of the problems and delivery delays that occurred on the earlier 5860 mainframe. "I believe [the 5870] is so important [to Amdahl] that they wanted to get all the bugs out," Smith said.

But so far, the bugs have been few. Ron Woodan, Chilton's executive vice-president of data processing, said the 5870 has made him "more pleased than any other Amdahl system we've ever had." Woodan recalled being one of the first customers to receive Amdahl's troubled 5860 processor and noted that aside from the minor problems that typically crop up in a new system, there is little similarity between his installation of the 5870 and the 5860.

The selection of Chilton as the first test user was not an accident. A former all-IBM shop, Chilton is the kind of customer that surely makes Amdahl officials proud. The company got rid of its IBM systems to become an all-Amdahl shop when, according to Smith, the company's DP requirements started growing at a rate faster than IBM could deliver new systems.

Chilton's DP work load also makes it appealing as a test site. A repository for credit information, Chilton has a combination of heavy batch and interactive processing involving monthly updates to approximately 100 million credit files supplied by approximately 10,000 different banks and

See AMDAHL page 86

INSIDE

Turnkey Systems/78
Data Storage/78
Terminals/78
Printers/Plotters/79
Graphics Systems/82
Board-Level Devices/83
Auxiliary Equipment/84

Front-end minicomputers introduced for Computer Automation's Syfa series

By John Desmond
CW Staff

DALLAS — Computer Automation, Inc. has announced the Model 150 and Model 170 interactive transaction processing and remote job entry minicomputers. The units act as front-end processors for the company's System for Access (Syfa) minicomputer family.

Aimed at users who require interactive high-volume data storage, processing and inquiry at distributed sites, the Model 150 is said to provide binary synchronous data communications. IBM's Systems Network Architecture (SNA) and the X.25 international standard protocol are available with the Model 170, the company said.

The Model 150 stand-alone unit is field-upgradable to a Model 170, and the Model 170 can be upgraded to become a resource processor in Computer Automation's Syfanet local-area network, the company said.

Both models weigh 92 lb and use a six-slot chassis packaged in a 19- by 13¼- by 23-in. cabinet, the company said. The cabinet is said to contain the CPU, memory access and management and data communications hardware. Both models can accommodate a 36M-byte Winchester disk drive, one 10M-byte streaming tape drive and eight or 16 asynchronous RS-232C multiplexer ports.

The ports can operate at up to 9,600 bit/sec to interface any combination of local and remote devices, such as keyboard and display terminals, printers and modems, the company said. The Model 150's binary synchronous data transfer rates range up to 4,800 bit/sec; the Model 170 offers binary synchronous data transfer rates, SNA and X.25 communications up to 9,600 bit/sec, the company said.

Standard software provided with the system includes Computer Automation's Syclops operating system, its Sybol application programming language and a num-

See MINIS page 86

DATA RENTALS SALES, Inc

HEWLETT PACKARD
7221C (Brand New) $2995
9872C (Brand New) $2995
2621A $895
2621B (w/Printer) $1995
7260A Card Reader $2495

TEXAS INSTRUMENTS
743 Portable $395
745 Portable $495
765 Bubble Memory $495
785 Portable $995

DEC
LA 34 .... $450
VT 131 .... $695
LA 100 BA - KSR $1695
LA 100 ZA - RO $1295

LEAR SIEGLER
ADM 3A $195
ADM 5 .... $325
ADM 21 .... $395

TELETYPE
SPECIAL BARGAIN
RECONDITIONED
AAE 4320 FRICTION FEED
$425

MODEMS
GDC 212A $195
Racal-Vadic 3451 .... $495
Racal-Vadic 3413 .... $495

ASSORTED
Soroc 130 .... $295
Execuport 4000 .... $495
Adds Viewpoint $295
Visual 100 .... $495
Visual 400 .... $495
GE 2120 - 32K Buffer $1995
Zeta 8-Pen Plotter $1995
Diablo 1620 LQ $995
Diablo 1640 LQ $995
NEC 5510 .... $995
GE Terminet 200 ASR (New) w/Pedestal & Basket .... Make Offer

TURNKEY SYSTEMS

BANCTEC, INC.
Four reader/sorter models

Banctec, Inc. announced four reader/sorter models for small banks, savings and loan institutions and commercial companies. These models operate on IBM mainframe computers and emulate IBM 1419 or 3890 reader/sorters.

Models 2660 and 2686 are six-pocket and 14-pocket reader/sorters, respectively, and are suited for remote item processing. The Model 2660 processes 830 document/min. Model 2685 processes 1,200 document/min and has an optional 1,400 document/min speed and optional endorser feature. It also has an off-line sort feature.

Models 2660 XT and 2685 XT are similar to the reader/sorters described above, but have been specially configured for the IBM Personal Computer XT.

Model 2660 is priced at $100,000, and Model 2686 costs $120,000. Model 2660 XT is $82,000, and 2685 XT is priced at $107,000.

Banctec, 4435 Spring Valley Road, Dallas, Texas 75234.

DATA STORAGE

DA-TECH CORP.
2000 series floppy disk subsystems

Da-Tech Corp. has announced the 2000 series of floppy disk subsystems with data file management capabilities. The units feature up to 1,600K bytes of storage and an RS-232C interface, the company said.

The stand-alone, file-oriented disk subsystems are said to include two or more 5¼-in., 400K-byte floppy disk drives, a disk controller and power supply. The 2000 series also includes the Model 2000 Da-Tech dual-drive master module, Model 2200 dual-drive expansion module and the Model 2240 complete quad-drive subsystem, the company said.

Additional features include directory-controlled file allocation, file and disk copy capability in the subsystem, an interchangeable 5¼-in. double-sided flexible disk and 25 system and maintenance commands for data transfer.

Single-quantity prices are as follows. The Series 2000 dual-drive master module with two drives, a microprocessor controller and dc power supplies costs $3,300. The Series 2200 dual-drive expansion module with two 400K-byte drives and dc power supplies costs $2,600, and the Series 2240 quad-drive subsystem, combining the master and slave modules in an integrated system storing up to 1,600K bytes of data, is $5,500, the vendor said.

Da-Tech, 92 Steamwhistle Drive, Ivyland, Pa. 18974.

NORTHERN TELECOM, INC.
Small computer systems interface

Northern Telecom, Inc. has announced a small computer systems interface for its Mercury 82000 series of 8-in. Winchester disk drives.

The interface, which will be imbedded in the Mercury's boards, was designed to support the drive's use with multiuser minicomputers and microcomputers. It was developed through a joint development agreement between Northern Telecom's Memory Systems Division and NCR Corp.

It reportedly supports a 1.5M byte/sec asynchronous data transfer rate, automatic error correction, interface capabilities such as disconnect/reconnect and arbitration, configuration by host, automatic error reporting and recovery and parity on the small computer systems interface bus.

The interface costs $772 when ordered with a drive. The three versions of the Mercury 82000 series are the 93M-byte unformatted 82040, priced at $5,320; the 187M-byte 82060, priced at $8,400; and the 234M-byte 82100, priced at $8,700.

Northern Telecom, Box 1222, Minneapolis, Minn. 55440.

TERMINALS

TANDBERG DATA, INC.
TDV 22378

Tandberg Data, Inc., has introduced a smart terminal said to compete with the Hewlett-Packard Co. 2622A smart terminal.

The Model TDV 22378 terminal has a 15-in. screen with bonded antireflex faceplate and a movable stand. Contrast and background intensity are adjustable.

The detachable keyboard has nonglare key tops and provides full editing capabilities, the vendor said. The 2237S features 16 user-programmable function keys that allow commonly used words and control sequences to be stored in nonvolatile memory and transmitted by pressing a single key.

According to the company, the 22378 will generate 192 characters, line drawing and special graphics symbols. Transmission is character-by-character, line-by-line or block mode with speeds ranging from 50 to 19,200 bit/sec. It has 48 lines of buffer memory and a standard one-page print buffer for local and remote printing.

Price of the TDV 22378 is $1,395.

Tandberg Data, P.O. Box 99, Labriola Court, Armonk, N.Y. 10504.

MEGATEK CORP.
Whizzard 1600 enhancements

Megatek Corp. has announced additional memory and color hard-copy output options for its Whizzard 1600 series desktop engineering terminals.

TALARIS
SYSTEMS INC.

Why buy a laser printer from a software firm?

Today's advanced laser printers, such as the *Talaris 1200* and the *Talaris 800*, contain significant memory and processing power for manipulating font, character, and graphics data. These printers have the computational power of the computer which drove them just a few years ago.

You need software to harness this printing power.

Talaris Systems excels in writing user-friendly software, resident on your host computer, making it easy for you to take advantage of the versatility of these powerful laser printers.

Talaris supports the complete system.

Talaris Systems develops the software, sells it along with the laser printers, and provides you with complete system support after installation.

Talaris manufactures fonts.

Talaris Systems has proportional and fixed-pitch fonts, including extensive math character sets. These fonts are used on the Talaris printers with many text processing programs, including:

- MASS-11*
- SCRIBE*
- TEX*
- TROFF

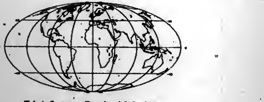
Talaris provides graphics support.

Talaris Systems provides interfacing routines for the following graphics packages:

- Calcomp HCBS
- Versaplot*
- Tektronix 4010/4014
- DISSPLA* & TELL-A-GRAF*
- DI-3000*
- SAS/GRAPH*
- RS/1*

Talaris has text and graphics integration: the QDRIVE* program.

QDRIVE enables you to easily integrate into a complete document output from many text and graphics sources. Using QDRIVE, this page was composed with TEX, merged with DISSPLA output and overlaid with the Talaris logo. The original was printed on a *Talaris 1200*.



Talaris Systems offers the global solution in laser printing.

Talaris supplies a family of laser printers.

The *Talaris 1200* is a 12 page-per-minute, 300 dots-per-inch printer, base price $24,990. The *Talaris 800* is an 8 page-per-minute, 300 dots-per-inch, desk-top printer, base price $9,990. Both are fully functioned text and graphics laser printers with many host interfaces available.

Contact Talaris Systems Inc., P.O. Box 8309, La Jolla, CA 92038, (619) 454-3363.

* MASS-11 is a trademark of Microsystems Engineering Corp. TEX is a trademark of the American Mathematical Society. Versaplot is a trademark of Versatec. DISSPLA and TELL-A-GRAF are trademarks of ISSCO. DI-3000 is a trademark of Precision Visuals, Inc. RS/1 is a trademark of Bolt, Beranek, & Newman. QDRIVE is a trademark of Talaris Systems Inc. SCRIBE is a registered trademark of Unilogic, Ltd. SAS/GRAPH is a registered trademark of SAS Institute.

SYSTEMS & PERIPHERALS

A 512K-byte memory expansion board is now available for both the monochrome Whizzard 1645 and the color 1650 model as a supplement to the standard 128K-byte random-access memory provided, the vendor said.

Megatek is also offering an eight-color, 150 dot/in. color thermal printer with 640- by 480-pixel resolution and a 44Hz interlaced interface.

The expansion board is available for new units or as an upgrade for existing users for $1,195. The thermal printer is priced at $13,500.

Megatek, 9605 Scranton Road, San Diego, Calif. 92121.

TELEX COMPUTER PRODUCTS, INC.
Telex 078, 079

Telex Computer Products, Inc. has announced the Telex 078, a 12-in. monochrome-model CRT terminal compatible with IBM's 3178, and the Telex 079 12-in. color model display, compatible with IBM's 3179.

Features of the displays include a two-piece, low-profile design; tilt-and-swivel and coiled-cable; and low-profile adjustable keyboard, the company said.

Both models are said to display 1,920 characters, and attach directly to either an IBM 3274 or 3276 controller or Telex's 174, 274C or 276 control units. Both models are also said to offer a choice of keyboard layouts, including several for the international market.

The price for the 078 display is $1,550, and the price for the 079 color display is $2,195, the company said.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

PRINTERS/PLOTTERS

DATASOUTH COMPUTER CORP.
TX5180 printer

Datasouth Computer Corp. has announced the TX5180 medium-speed dot matrix printer for use with IBM System/34, 36 and 38 CPUs.

The TX5180 is said to interface directly to IBM systems via a standard twin-axial compatible host and an Ascii system such as the IBM Personal Computer.

The TX5180 is said to operate at 180 char./sec, generating from 75 to 400 line/min. Selectable horizontal pitch is said to allow printing at 10, 12 or 16.5 char./in. as well as expanded print for highlighting text. An adjustable tractor feed handles forms from 3- to-15-in. wide and multipart forms up to six copies, the vendor said.

The TX5180 costs $2,995, the vendor said.

Datasouth Computer, 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

VERSATEC, INC.
Model 290 Personal Plotter Interface Unit

Versatec, Inc. a Xerox Corp. company, has announced the Model 290 Personal Plotter Interface Unit for interfacing the company's Expert workstations directly with all Versatec electrostatic plotters.

The interface is said to be compatible with Versatec's 512A multiplexer, permitting resource sharing. Versatec workstations can also be linked to output peripherals compatible with Ethernet plot and print servers or to an RS-232 serial interface.

The 290 interface may be located up to 20 feet from the workstation and 1,000 feet from the plotter. The unit weighs 17 lb and measures 4½-in. by 12-in. by 15½-in.

The price for the 290 interface is $3,995, the company said.

Engineering Information Systems, Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

INNOVATIVE ELECTRONICS, INC.
300-LPM printer for Burroughs

Innovative Electronics, Inc. has announced that its 300-LPM printer can now be interfaced with Burroughs Corp. equipment via RS-232,

Continued on page 82

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SYSTEMS & PERIPHERALS

Continued from page 79

concatenation or the Burroughs two-wire direct interface.

Controlled by a Teletype Corp. Model 40 controller board and using an Intel Corp. 8086 microprocessor, the 300-LPM is said to use a Teletype Model 40 print mechanism employing heavy-duty chain technology. The 300-LPM prints characters at a speed of 300 line/min, the company said. Speeds of approximately 400 line/min are achieved by using the 48-char. set, the company said.

Uppercase and lowercase characters are generated on up to six copies, and 132-col., 80-col. and forms access or ticket models are offered, the company said.

The 132-col. printer costs $6,295, and the 80-col. version costs $5,795.

Innovative Electronics, 44714 165th St., Miami, Fla. 33014.

AUTOVATIVE COMPUTER EXTENSIONS, INC.

ACX-PM Printer Manager

Autovative Computer Extensions, Inc. has announced the ACX-PM Printer Manager software for managing and controlling small printers in the IBM VM/SP operating system environments. All IBM 3270 devices and compatible printers, as well as certain Ascii printers connected via asynchronous communication lines, are said to be supported.

The Asynchronous Ascii Printer option is said to support serial interface Ascii printing devices connected or dialed to asynchronous communications ports.

The operating characteristics of each printer can be controlled by user-specified parameters so that support can be tailored to specific printer models, the company said.

The cost of a one-year lease is $1,000 for the ACX-PM Printer Manager base, $1,500 for the 3270 printer option, $500 for the 3268/3287 graphics printer option and $1,500 for the Asynchronous Ascii Printer option, according to the vendor spokesman.

Autovative Computer Extensions, Suite B, 5120 Belmont Road, Downers Grove, Ill. 60515.

INNOVATIVE ELECTRONICS, INC.

Innovator 202 enhancements

Innovative Electronics, Inc. has announced extended communications interface capability for its Innovator 202 300 line/min printer system.

Added features for the Innovator 202 are said to include IBM 3287 Model 1 and Model 2 emulation with Type A coaxial connection and compatibility with IBM 3274 and IBM 3276 controllers.

The system reportedly supports transparent-mode compatibility, processor interrupt transmission, local or remote configuration, bisynchronous or IBM Systems Network Architecture (SNA) data streams, an SNA control string capability and built-in diagnostics.

The Innovator 202 132-col. version is priced at $7,395, according to the vendor.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

GRAPHICS SYSTEMS

CAV CORP.

Cavcad Turnkey System Series 200

CAV Corp. recently announced the Cavcad Turnkey System Series 200, for architectural, engineering and construction and mechanical applications.

The turnkey system uses the Unix operating system and includes a Hewlett-Packard HP 9000 Series 200 minicomputer, a color graphics terminal, a digitizing tablet with stylus pen and end-user training and support programs.

The unit reportedly includes 256 design layers, eight simultaneous view capabilities, more than 100 drafting symbols, automatic dimensioning, automatic generation of bills of material and multiuser and multitasking capabilities.

According to the vendor, the Cavcad system has networking capabilities and can expand to multiple workstations at an incremental cost of $16,500.

The Cavcad Turnkey System Series 200 is priced at $65,000, the vendor said.

CAV, Suite 304, 3130 La Selva Drive, San Mateo, Calif. 94403.

BAUSCH & LOMB, INC.

Producer II

Bausch & Lomb, Inc. has announced the Producer II drafting system for the computer-aided design marketplace. The system includes two 19-in. monochromatic graphics displays, a controller with 27M-byte Winchester disk drive, the DMP-52 sheet-fed plotter, menu pad, workstation desk and a library of 5,000 predrawn figures, the company said.

The two 1,024- by 800-pixel resolution displays are said to show an entire drawing on one screen while completing detail work on the other screen. Each intelligent raster display is said to have its own Motorola, Inc. 68000 microprocessor.

For plotter technology, the Producer II is said to employ the servo-driven DMP-52 plotter offering pen speeds of up to 22 in./sec and a resolution of 1/1,000 in. The plotter weighs 32 lb, the company said.

The Producer II system is priced at $41,900.

Bausch & Lomb, P.O. Box 14547, Austin, Texas 78761.

GERBER SCIENTIFIC INSTRUMENT CO.

Video Digitizing System Model 2500

The Gerber Scientific Instrument Co., has announced the Video Digitizing System (VDS) Model 2500 com-

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And both terminals come with a wide variety of advanced graphics features. Resident vector draw. Point plot. Circle and arc draw. Rectangle draw. Multiple line styles and patterns with rectangle pattern fill. Plus an auxiliary port to support printer/plotters and data tablets.

As an alphanumeric terminal, the VISUAL 500 provides selectable emulations of the DEC VT52,® Data General D200, Lear Siegler ADM-3A™ and Hazeltine 1500 terminals. While the VISUAL 550 is DEC VT100® protocol-compatible as well as a character or block mode terminal which complies to the ANSI X3.64 standard.

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puter-controlled line follower, said to digitize documents automatically while converting engineering drawings into vector data for computer-aided design (CAD) manipulation.

Aimed at aerospace, automotive, shipbuilding, cartographics and architectural engineering industries applications, the VDS is said to capture vector data automatically while following a line, line segment or curve to indicated end points. The VDS is said to indicate a line with two points, as opposed to raster systems, which indicate a line with thousands of points, the company said.

The VDS hardware includes a console housing a 13-in. color CRT, keyboard, joystick, a microcomputer system based on the Motorola, Inc. 68000 to control the digitizer and support the graphics and operator interface and a 36M-byte Winchester disk for local storage of digitized data, the company said. A 3½-in. floppy disk for archival purposes is standard with the system, and an 8-in. floppy disk for data storage is optional, the company said.

A 13-in. color CRT is said to be capable of assigning up to 64 digitizing layers for geometry, text and other instructions. The VDS is said capable of turning a two-dimensional drawing to a three-dimensional data base for the CAD system.

The VDS is configured with GST's Model 78 modular large-area drafting system, which is said to digitize data automatically with two video cameras at speeds of 200 in./min. The VDS data base is produced in RS-274D plotter format, said to allow transmission to a host CPU via parallel or RS-232 interfaces.

VDS plotter data can be used to drive numerical control equipment directly, or it can be sent to a Gerber PMS 7000 for driving drafting or manufacturing machines, the company said.

The price for the VDS Model 2500 workstation is $70,000, and the price for a system including the plotting table is $170,000, according to the vendor.

Gerber Scientific Instrument, P.O. Box 305, Hartford, Conn. 06101.

BOARD-LEVEL DEVICES

ADAPTRONICS PRODUCTS
SBDTR-8160

Adaptronics Products, a division of General Research Corp., has announced the SBDTR-8160 digital transient recorder, said to combine an 8-bit, 20-MHz analog-to-digital converter, 4K bytes of on-board buffer memory and digital control logic into a single Intel Corp. Multibus-compatible circuit board.

Under software control, the SBDTR-8160 is said to trigger an external device, accept an external trigger or trigger on an overthreshold input signal. Pre- and post-trigger modes of operation are available under software control as well. In the pre-trigger mode, from 0 to 4,064 bytes of data can be scheduled for acquisition, with the remainder of the buffer being filled by pre-trigger data; in the post-trigger mode, from 0 to 4,064 data point time periods can be scheduled to be counted off after trigger, the company said.

The SBDTR-8160 features 24-bit addressing. Typical applications include robotics, biomedical equipment, acoustical instrumentation, ultrasonic equipment and other applications requiring high-speed analog-to-digital sampling rates, according to the vendor.

The product costs $2,400, the vendor said.

Adaptronics Products, General Research, 7655 Old Springhouse Road, McLean, Va. 22102.

MATROX ELECTRONIC SYSTEMS, LTD.
SX-900

Matrox Electronic Systems, Ltd. has announced the SX-900, a single-board color graphics display monitor based on the Intel Corp. 80286 microprocessor. Features include a resolution of 640 by 480 pixels in four- or eight-bit planes.

The SX-900 also features an interface with Intel's Multibus and a 60Hz flicker-free video refresh rate. The 80286 front-end display list processor is supported by an NEC Information Systems, Inc. Graphics Display Controller 7220 processor and Matrox's pixel processor for simultaneous eight-plane drawing. The pixel processor also provides a read-modify-write capability, said to be used for nondestructive cursor overlays.

The SX-900 is said to incorporate the same on-board graphics firmware used by the Matrox GXB-1000 series display controllers. Over 256 display list commands are supported, including line, character, circle and arc drawing, area fills and cursors, the vendor said.

By itself, the SX-900 is said to provide a single-board solution for process control and instrumentation applications. Multiple SX-900 boards can be used in the same chassis to drive several independent displays for process control consoles or can be ganged to provide up to 24 bit/pixel for imaging applications, the vendor said.

The SX-900 costs $2,995 for 4 bit/pixel, or $4,195 for 8 bit/pixel, the company said.

Matrox Electronic Systems, 5800 Andover Ave., Montreal, Quebec, Canada.

MDB SYSTEMS, INC.
MLSI-STS11

MDB Systems, Inc. has announced the MLSI-STS11 magnetic tape streamer controller/coupler, emulating Digital Equipment Corp.'s TS11/TSV05 software, for use with Control

Continued on page 84

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SYSTEMS & PERIPHERALS

Continued from page 83

Data Corp.'s Sentinel ¼-in. tape cartridge subsystem.

Features of the 16-bit Advanced Micro Devices, Inc. 2901 microprocessor-based coupler include software that can be configured via the operator's console for such functions as addressing, interrupt vector, bus priority level and coupler emulation modes, the company said.

The coupler is a single-quad board that contains all the necessary logic for DEC TS11 or TSV05 software-compatible commands from a DEC LSI-11/23 or -11/73 Q-bus processor.

The MLSI-STS11 is priced at $1,850, according to the vendor.

MDB Systems, Box 5508, 1995 N. Batavia St., Orange, Calif. 92667.

STANDARD MICROSYSTEMS CORP.
Cardinal

Standard Microsystems Corp. has announced the Cardinal video terminal board, based on the company's CRT 9028 Video Terminal Logic Controller, a nine-chip terminal board said to provide a video terminal section for microcomputer systems.

Features include thin and wide graphics, smooth scrolling and a menu-driven setup mode stored in nonvolatile memory, the company said.

The Cardinal is said to support two RS-232 ports, to operate in full- and half-duplex modes and to allow the selection of either steady or blinking block cursor. Other features include parity generation and detection and transmission rates ranging from 110 bit/sec to 19.2K bit/sec, the company said.

The Cardinal Video Terminal Board costs $199 in single quantities and will be available in the third quarter, the vendor said.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

TANDBERG DATA, INC.
Graphics board

Tandberg Data, Inc. has announced a plug-in board that transforms its Series TDV 2200S terminals into a bit-mapped graphics system with a resolution of 720 by 336 pixels.

The board reportedly works in four modes: enhanced alpha and graphics, vector, point and interactive graphics mode.

In enhanced alpha and graphics mode, the terminal reportedly generates character sets in a variety of sizes, shapes and sets, including an Ascii character set, four special character sets and three downloaded character sets.

The vector mode creates primitive graphics using solid, dotted or dash lines, according to the vendor. In point mode, the terminal emulates a Tektronix, Inc. 4010 terminal, provides 1,024- by 780-pixel resolution and generates a point instead of a line.

The interactive graphics mode allows the 2200S to emulate Tektronix' 4014 terminal and provide business, scientific and engineering graphics capabilities.

The board costs $1,395.

Tandberg Data, P.O. Box 99, Labriola Court, Armonk, N.Y. 10504.

AUXILIARY EQUIPMENT

HENDRIX TECHNOLOGIES, INC.
Typereader Model TR100

Hendrix Technologies, Inc. has introduced an optical character recognition page reader, the Typereader Model TR100.

The unit offers common type style recognition, optional data transfer to two separate computer systems, automatic type style and pitch determination.

The TR100 is less than 2-ft deep and 2-ft wide and can handle up to 100 pages of paper. It uses the multiple similarity method of multifont recognition to ensure accuracy, the vendor said.

The TR100 is priced at $11,500, which includes three user-selected fonts. Additional fonts are available for $750 each, and the ability to transfer data to a second system costs $1,000.

Hendrix Technologies, 670 N. Commercial St., Manchester, N.H. 03101.

MARCONI INSTRUMENTS
6920

Marconi Instruments has announced a radio frequency sensor reportedly designed for low power measurements.

This is said to include receiver input sensitivity and amplifier noise.

The 6920 is said to have high sensitivity, which allows it to measure signals as low as .1 nW in the frequency range from 10 MHz to 20 GHz.

The 6920 sensor is priced at $795, according to the vendor.

Marconi Instruments, 100 Stonehurst Court, Northvale, N.J. 07647.

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MINIS

from page 77

ber of utility routines and program development aids, the company said.

The price of a Model 150, with 128K bytes of 750 nsec random-access memory (RAM), a 150 nsec CPU cycle time and parity checking is $9,950. The price of a typical configuration, including a 36M-byte 5¼-in. Winchester disk drive, 10M-byte streaming tape drive, keyboard and display terminal and eight asynchronous multiplexer ports, is $17,250.

The price of a Model 170, with 128K bytes of 550 nsec RAM (expandable to 256K bytes) with a 150 nsec CPU cycle time and error-correcting code, is $13,950. A typical configuration costs $21,250.

Computer Automation's Commercial Systems Division is at 1800 Jay Ell Drive, Richardson, Texas 75081.

AMDAHL

from page 77

credit organizations. Interactive inquiries come from some 5,000 terminals using approximately 2,300 simultaneous communications lines. Communications is handled via a combination of a proprietary file organization scheme and Applied Data Research, Inc.'s Datacom/DC data communications software, Woodan said.

The 5870 is currently using IBM's MVS-SP Release 13 operating system, but Smith said Chilton has plans for installing Amdahl's version of IBM's MVS/XA operating system next spring.

Since the system was installed in May, Woodan said, Chilton has only managed to perform benchmark tests on the on-line 5870 operation. But based on those findings, the 5870 can perform on-line transactions 60% faster the the 5860. He added that Chilton expects that the 5870 will perform at least 1.7 times faster than the 5860, with enough performance (roughly 21 millions of instructions per second, according to Woodan) to stop using its older Amdahl 470/V8 processor in a production mode. Woodan added that the 470/V8 will eventually be used as a test processor using IBM's VM operating system.

Admitting the smooth installation and relatively problem-free operation may be, at least in part, a result of having Amdahl's best systems engineers on site during the early weeks of the 5870's use, Smith was quick to add that after the first two or three weeks, Chilton resumed dealing with the same local field support people it had been using for some time.

IBM/EEC

from page 77

nal IBM edict.

Nonetheless, some IBM competitors seem pleased with the outcome of the EEC investigation and are convinced the agreement will ultimately help users.

One maker of IBM-compatible high-end mainframes, Amdahl Corp., has been particularly vocal in voicing it's delight with the four-month policy. The reason, according to an Amdahl executive, is that prior to the EEC agreement, IBM had no obligation to release any information about its products. Regardless of whether the four-month policy fits neatly into IBM's business plan, the Amdahl executive said, plug-compatible manufacturers now appear to have an avenue to force IBM to disclose specifications about its high-end products.

It is obvious that it will not take long for technical specifications forced out of IBM in Europe to wind up included in competitive products released in the U.S. Therefore, U.S. users do stand to benefit from the EEC agreement. But how long it will take to get that technical data out of IBM is another unanswered question.

It is clear IBM made its concessions to the EEC in good faith. But there appear to be enough holes in the EEC agreement to give IBM the option of holding back technical information if it so chooses.

Not off the hook

The EEC made it clear by suspending, not terminating, its antitrust investigation of IBM that IBM has not simply been let off the hook. But the EEC has not stated what will happen to IBM if it fails to comply with the terms of the agreement. The EEC has said it will continue to monitor IBM's business practices and attempt to make sure IBM discloses adequate technical specifications to its European competition. But it has not offered a detailed explanation of how this will be done.

It seems possible that IBM could easily stall the release of technical information past the four-month deadline.

For example, IBM could release a set of new product specifications to the competition in compliance with the four-month time frame. If IBM competitors felt that information was inadequate, they would have to complain to the EEC, which would have to investigate the situation before passing judgment. Technically, IBM could argue it complied with the Aug. 2 agreement by supplying what it felt were adequate technical specifications. If the EEC disagreed, IBM could simply give in and supply more information.

It is unfair to assume automatically that IBM will not comply with its voluntary agreement. After all, the agreement is not even three weeks old.

And it is clear IBM could suffer far more than the wrath of the EEC if it should renege on its voluntary agreement. Such a move could hurt the company's reputation all over the world.

What is clear, however, is that IBM has realized the computer marketplace is global. What is done in one corner of the world affects everyone everywhere else. And once a technical tidbit is out of the proverbial bag, there is little hope of limiting the number of people privy to it.

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MICROCOMPUTERS

Designing software for the way people (not micros) think

By Robert Gilchrist
Special to CW

Part one of a two-part series that will examine current personal computer software limitations and solutions.

The personal computer, predictions tell us, is in the process of changing the face of the modern office. What the prognosticators neglect to explain is that first the face of software has to be changed. In recent years, relational data bases, windowing environments and integrated packages have emerged, but none begin to support a personal computer as a true businessman's tool rather than as a glorified calculator, word processor or electronic filing system.

The key to the revolution in software now lies in products designed for the way people work and think rather than the way a computer operates. The on-going tasks of most business people are unstructured and based on the storing and retrieving of information from many sources: the person's memory, notebooks, files, fellow workers.

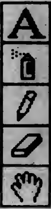
Each piece of information relates to other bits of data in different ways, and the person remembers and organizes data for a variety of purposes. Equally important, the business day of all people is marked by frequent interruptions, both from outside sources and by internal prompts such as the memory of a call that has to be made. A person must be able to respond to an interruption and then return to the task at hand, as well as to move easily from one task to the next.

For a personal computer to be a working tool, it must operate in this human environment swiftly and efficiently. Traditional software does not allow this. Most packages are either highly structured data

See PEOPLE page 96

Gilchrist is chairman of Dayflo, Inc., an Irvine, Calif., microcomputer software vendor.

Icons point to changes



By Kathleen Sullivan
CW West Coast Bureau

RESEARCH TRIANGLE PARK, N.C. — When Naudeen Beek, office systems manager for Burroughs Wellcome Co., a pharmaceuticals firm based here, wants to print out a document that requires particular formatting commands, she does not reach for a manual to look up the series of command strings that will accomplish the task. Instead, she reaches for her mouse, points to one of several icons on the screen that resemble miniature printers and presses a button.

Halfway across the country, in Dallas, Rick Wohleber goes through a similar procedure when he wants to search for a file. Wohleber, data processing systems development manager for Collins Transmission, a division of Rockwell International Corp. that makes microwave radios, does not use the keyboard to type out commands to find his file. Like Beek, he uses a mouse to "burrow through" a series of file folder icons on the screen.

Both Beek and Wohleber are sold on the technology that has brought bit-mapped displays, icons, windows and mouse pointing devices to their offices. They champion the technology with enthusiasm, saying it has added greater accuracy, speed and efficiency to their work.

In addition, they said, it has cut down on the time needed to train new computer users.

"One of the worst problems encountered in trying to move into office automation is the work of getting people to be comfortable with ma-

See ICON page 97

MICRO BITS/THOMAS W. MADRON

Front-end software cuts costs, time

Communications software designed to provide users with transparent access to third-party data bases is rapidly emerging.

One class of software can be described as front ends for specialized remote services, such as those offered by Dow Jones & Co. and Dialog, Inc. These products save communications costs by setting up and debugging searches for information locally before completing the search. Another advantage of front ends is that they reduce the time required to learn how to complete a search, which is especially difficult in a complicated data base like Dialog.

One example of such software is In-Search from Menlo Corp., located in Santa Clara, Calif. In-Search provides relatively easy access to Dialog data bases at Lockheed's Dialog Information Services, Inc. Dialog specializes in bibliographic data bases with collected data from a variety of sources: publishers, government agencies, corporations and other groups.

To learn how to formulate searches with Dialog, a two-day training session is required. The result of this is that libraries have become the primary users of Dialog, although a lower cost, more easily accessed version of the system is now available.

In-Search, which runs on a variety of

See FRONT page 96

Madron is manager of computer services at North Texas State University, Denton, Texas.

■ Ashton-Tate's Framework drives 35 types of printers/98

■ Applied Digital Data Systems, Inc. introduces IBM compatible with foreign-language options/98

INSIDE

Software/96

Systems/94

Softech offers system development environment for Apple's Macintosh

SAN DIEGO — A software development environment that runs on Apple Computer, Inc.'s Macintosh and consists of UCSD Pascal and Fortran-77 development systems was announced by Softech Microsystems, Inc.

The development system, scheduled for shipment this month, reportedly marks the first offering of compiled Pascal and Fortran languages for the Macintosh and the incorporation of what is said to be the only Motorola, Inc. 68000 Assembler, according to Softech.

"Our system provides not only a vehicle to write large and complete applications on the [Macintosh], but paves the way for the porting of a host of UCSD Pascal applications," said Larry Allman, Softech Microsystems vice-president of marketing.

Softech Microsystems stated that UCSD Pascal and Apple Pascal are sufficiently compatible to allow easy porting of Apple II and III programs to the Macintosh. Pascal applications running on other machines, such as the IBM Personal Computer, can also be ported to the Macintosh, Softech Microsystems claimed.

The UCSD Pascal Development system reportedly accesses the Macintosh's mouse-actuated graphics and text fonts and is priced at $195.

The Fortran-77 Development System is priced at $295 and the Advanced Development Tool Kit, which includes the 68000 Assembler and source code for the graphics/mouse interface, is priced at $150.

Softech Microsystems is located at 16885 W. Bernardo Drive, San Diego, Calif. 92127.

Dilithium links IBM Personal Computer to Apple's Macintosh

BEAVERTON, Ore. — Dilithium Press Ltd. has announced PC to Mac and Back, a communications package designed to link an IBM Personal Computer and an Apple Computer, Inc. Macintosh.

The product transfers files between an IBM Personal Computer and a Macintosh, two Macintoshes or an IBM Personal Computer and any computer with an RS-232 serial port, Dilithium said.

The product provides four protocols:

■ Text with handshake that reportedly provides error detection and ensures proper transmission intervals.

■ A proprietary protocol that transfers files at speeds between 110 and 9,600 bit/sec, automatically saves transferred files and can transmit a group of files.

■ X-modem, which is an industry-standard protocol that possesses error detection and correction.

■ Ascii, which does not possess error detection or correction and is designed to transmit simple text transfer.

The product runs on an IBM Personal Computer with 128K bytes of random-access memory (RAM) and Microsoft Corp.'s MS-DOS operating system or a Macintosh with 128K-byte RAM. The product works with a null modem or most popular modems, Dilithium said.

PC to Mac and Back costs $100, the vendor said.

Additional information is available from Dilithium Press, which is located at Suite 151, 8285 S.W. Nimbus, Beaverton, Ore. 97005.

Adds releases IBM compatibles with foreign-language capabilities

NEW YORK — Two IBM Personal Computer-compatible microcomputers that offer the choice of six foreign language versions of Microsoft Corp.'s MS-DOS operating system and appropriate keyboards have been introduced by Applied. Digital Data Systems, Inc. (Adds).

The Adds PC/I reportedly has 256K bytes of memory, twin 360K-byte diskette drives, a keyboard and an optional 12-in. monitor. The second model, the Adds PC/II, includes a 10M-byte Winchester drive.

Both micros reportedly use an Intel Corp. 8088 microprocessor and provide 40-col. by 25-line or 80-col. by 25-line displays. The micros also reportedly support light pens, a radio frequency modulator interface and serial or parallel printers.

Features

They are said to feature an Intel 8087 coprocessor, five expansion slots, Microsoft's GW Basic and self-diagnostics.

The monitor reportedly offers tilt-and-swivel capability and 320- by 200-pixel resolution in graphics mode and 640- by 200-pixel resolution in monochrome mode. The detachable keyboard reportedly includes an LED to indicate operational status.

The foreign language versions of the operating system reportedly offer status, diagnostic and error messages in the same language as their operating sytem.

The Adds PC/I is priced at $2,650 with monitor, $2,445 without one. The Adds PC/II is priced at $4,200 with monitor, $3,995 without a terminal.

Additional information is available from Adds Display Products Division, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

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'Framework' to drive HP's Laserjet

CULVER CITY, Calif. — Ashton-Tate has announced that its Framework integrated software package will interface with 35 printers, including Hewlett-Packard Co.'s Laserjet printer.

Laserjet, priced at $3,495, reportedly can utilize Framework's ability to incorporate both text and graphics on the same page. Framework also provides on-screen preview of what will appear on the page.

Framework, which runs on the IBM Personal Computer, will reportedly support a number of laser, inkjet, dot matrix and daisywheel printers, including HP's Thinkjet printer and the complete line of Epson America, Inc. printers.

Framework, which combines a word processor, a spreadsheet, business graphics, data base management, telecommunications, an outline generator and a procedural programming language, is priced at $695.

Additional information is available from Ashton-Tate, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

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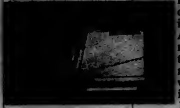

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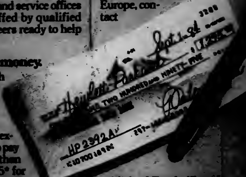

Michael Zandwijken, Hewlett-Packard, Dept. 003199, P.O. Box [illegible], 1180 AM Amstelveen, The Netherlands.

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SOFTWARE

KEPNER-TREGOE, INC.
Decision Aide

Kepner-Tregoe, Inc. has introduced its Decision Aide software, which reportedly advises managers on systematic decision making. The package is said to run on the IBM Personal Computer, Personal Computer XT, the Digital Equipment Corp. Rainbow and Hewlett-Packard Co.'s HP 150.

Decision Aide reportedly produces a report to document the manager's decision or recommendation and is designed for managers with limited computer experience. It requires two diskette drives and 128K bytes of memory and comes with a sample decision on diskette, a case study illustrating its concepts.

Decision Aide is priced at $250.

Kepner-Tregoe, P.O. Box 704, Princeton, N.J. 08542.

ZILOG, INC.
Application packages

Zilog, Inc. has introduced seven application packages for its multiuser, Unix-based System 8000 supermicrocomputer.

Among the application packages are two spreadsheets: Supercomp-Twenty from Access Technology, Inc. and Microsoft Corp.'s Multiplan. Word processing packages offered are Q-One from Quadratron Systems, Inc. and XED from Computer Concepts, Ltd.

Two data base management packages are also offered: Unify from Unify Corp. and Informix from Relational Database Systems, Inc. The graphics package offered is DI-3000 from Precision Visuals, Inc.

The software is priced as follows: Supercomp-Twenty, $1,100; Multiplan, $750; Q-One, $695; XED; $1,050; Unify, $1,995; Informix, $1,695; and DI-3000, $2,500.

Zilog, 1315 Dell Ave., Campbell, Calif. 95008.

ARTHUR D. LITTLE, INC.
ADL-Irma

Arthur D. Little, Inc.'s Information Systems Group has introduced a software package for IBM Personal Computers that reportedly supports structured systems analysis by documenting data flows and business processes.

ADL-Irma reportedly permits creation of flow diagrams on standard dot matrix graphics printers and the generation of cross-references and other listings.

Other features of ADL-Irma are said to be the integration of structured analysis and logical data design, data structure diagrams and data element level documentation.

ADL-Irma is priced at $25,000, including full training and maintenance and all needed copies of the program

Arthur D. Little, Information Systems Group, 17 Acorn Park, Cambridge, Mass. 02140.

CELESTIAL SOFTWARE, INC.
Enhanced Images-2D

Celestial Software, Inc. has enhanced Images-2D, a finite element analysis program that runs on the IBM Personal Computer.

The enhancements enlarge the Image element library to include triangular plates and nodal springs, in addition to the beams and trussles previously available, Celestial Software said.

Improved modeling is reportedly provided with the addition of a rotational pin code release and the capability for describing beam shear deflection.

Images-2D requires an IBM Personal Computer with 192K bytes of random-access memory, a color graphics adapter board, a color monitor and an Intel Corp. 8087 coprocessor.

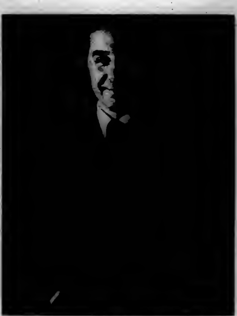
Images-2D for static analysis costs $500, while a package that includes static and dynamic analysis sells for $1,300.

Celestial Software, 125 University Ave., Berkeley, Calif. 94710.

See SOFT page 94

Bob Whatsisname
in Accounting.
He's into computers.

Yours.



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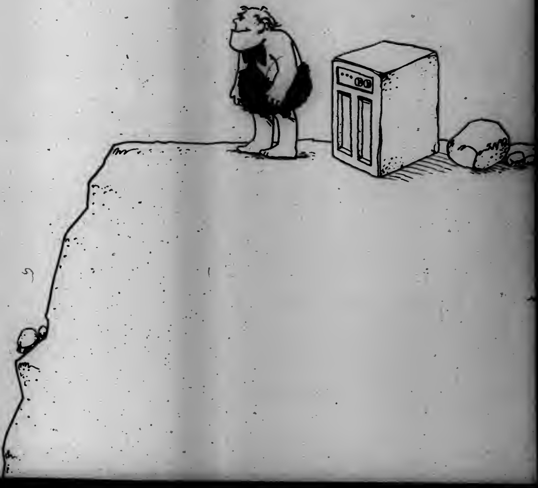

SOFT from page 90

CIE SYSTEMS, INC.
Cnix Utilities

CIE Systems, Inc. has introduced Cnix Utilities, software system tools that are said to supplement standard Alcyon Corp. Regulas operating system utilities now available for the vendor's 680 line of business microcomputers.

Cnix Utilities are said to be derived from the original Unix System III and System V source code and to provide additional functions that are not available with Regulas. These include a full screen editor, called vi; a source code control system; and Unix-to-Unix copy capabilities.

Cnix Utilities also feature additional tools for system administrators and developers. Documentation help files and program libraries are standard with the product.

Cnix is priced at $875.

CIE Systems, 2515 McCabe Way, Irvine, Calif. 92713.

TRANSACTION MANAGEMENT, INC.
Retail Program Library

Transaction Management, Inc. has announced the Retail Program Library (RPL), a series of software subroutines designed for use on fully programmable point-of-sale terminals that run Digital Research, Inc.'s CP/M operating system.

The package is intended for use by retail chain store businesses.

RPL, written in PL/1, can be used in transaction sets written in C, Cobol and Pascal, according to the vendor. Some of the more than two dozen subroutines included in the RPL package are sales person ID entry, calculate tax, credit authorization and refund. Customization can be done to allow for individual needs.

RPL is available by license at a cost of $1,000 for 10 licenses.

Transaction Management, 271 Lincoln St., Lexington, Mass. 02173.

GRAPHIC COMMUNICATIONS INC.
Graphwriter Version 4.2

Graphic Communications, Inc. has introduced Graphwriter Version 4.2 for the IBM Personal Computer and Personal Computer XT running Microsoft Corp.'s MS-DOS operating system.

Graphwriter Version 4.2 reportedly offers support for additional output devices, including Epson America, Inc.'s and Okidata Corp.'s dot matrix printers and the Hewlett-Packard Co. HP7550A plotter.

Graphwriter Version 4.2 is also said to offer text styles in addition to its current array of raster and vector fonts. It reportedly features a batch processing capability to allow users to create charts in succession with or without operator assistance. Batch processing reportedly permits users to share output devices and/or operator costs.

Graphwriter Version 4.2's Basic and Extension sets can be purchased for $395 each or $595 for both options. The upgrade cost for current Graphwriter users is $75 per copy.

Graphic Communications, 200 Fifth Ave., Waltham, Mass. 02254.

SYSTEMS

SEIKO INSTRUMENTS USA, INC.
GC-1000 Series

Seiko Instruments USA, Inc. has introduced its GC-1000 Series Graphics Computer, reportedly designed as an adjunct to the firm's D-Scan terminals.

The GC-1000 reportedly converts any of the D-Scan GR-1100 series or GR-2400 series color graphics terminals into a workstation for high-resolution graphics. The GC-1000 reportedly offloads from the host and streamlines communications.

The GC-1000 series is based on the 16-bit Intel Corp. 8086 microprocessor and offers a variety of mix and match options for OEMs.

The Model 1020 reportedly offers 256K bytes of random-access memory; one 5¼ in., 655K-byte diskette drive; and a bidirectional Centronics Data Corp. parallel interface.

The Model 1030 is said to offer the features of the Model 1020 and a four-slot Intel Multibus card cage.

Prices for models in the GC-1000 series begin at $4,950.

Seiko Instruments USA, 1623 Buckeye Drive, Milpitas, Calif. 95035.

G. O. GRAPHICS, INC.
Horizon MCS Conversion System

G. O. Graphics, Inc. has introduced its Horizon MCS Conversion System, which reportedly allows users of the Compugraphics Corp. Modular Composition System to integrate IBM-compatible personal computers into their workstation environments.

According to a vendor spokesman, the Horizon system reportedly offers the ability to convert word processing data disks directly to MCS format on the IBM Personal Computer.

It also reportedly allows users to reverse the process and convert MCS disks to IBM Personal Computer files.

The product is said to provide bidirectional communications supporting asynchronous and synchronous protocols and to include multipass translation tables incorporating G.O. Graphics notation, the company spokesman said.

The Horizon System is said to consist of a master program disk, IBM Personal Computer-compatible communications card and a user's guide, according to the vendor. The system is priced at $2,950, the spokesman said.

G. O. Graphics, 18 Ray Ave., Burlington, Mass. 01803.

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   Vendors
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer Service Bureau/Software/Planning/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
   95. Other Vendor (Please Specify)
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   41. Engineer/Scientific/R&D/Technical Mgmt.
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   90. Other (Please specify)
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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

145

SPSS inc.

FRONT

from page 87

Microsoft Corp.'s MS-DOS machines, uses on-screen graphics to guide the user through each step of a search. This technique eliminates complex commands and the need for extensive training. When the search is set up, In-Search dials Dialog, logs on, submits the search, downloads the results and informs the user of its completion so he may log off. Information is then browsed locally. In-Search can be easily learned, so it is not necessary to complete the Dialog training program, although that might still be helpful. To use the service effectively, a subscription service providing a local file of current Dialog data bases is required.

A product similar to In-Search is Texas Instruments, Inc.'s Dow Jones Natural Link software. This package, developed for the TI Professional computer, helps users access the Dow Jones financial data base. The program was based on the TI Natural Language Toolkit, a software development system designed to provide a natural language interface between the micro and the user. The software allows the user to bypass Dow Jones' complex command language and set up a search in a simple fashion.

An interesting TI Natural Language feature is that it can surround other products with a natural language interface. Some of TI's other communications products, such as the software for the IBM 3278 emulator hardware, can be called as a subroutine from the Natural Language shell. This allows large organizations to customize mainframe data base systems access by TI Professionals.

The primary disadvantage of In-Search and the TI Dow Jones package is that a user must have a unique communications program for every service. Only when a general-purpose menu program or other integrating software becomes available can one build a powerful communications workstation capable of accessing a wide variety of local and remote computer services.

While products such as those described above do not represent the final word for easy-to-use communications, they do point to further software development. In the next few years, computer centers will have to expend a great deal of effort to develop consistent, user-friendly software that accesses services offered on large central systems.

'Behave yourself.'

PEOPLE

from page 87

bases unsuitable for flexible human interaction or products, such as a spreadsheet or word processor, centered on a specific task. The function of word processing and spreadsheet software was fine for 8-bit machines, but does not take full advantage of 16- and 32-bit systems.

Windowing has been championed as a solution to current problems, for it offers simultaneous access to different applications. When windows are used to look at two or more things simultaneously, they are somewhat useful and will be more useful as screen resolutions improve. To transfer data from one program to another, however, windows are inappropriate and represent only a short-term solution.

For windows are an admission that one does not have a central filing system. In the practical world, we cannot afford to maintain data in seperate data bases. In the mainframe world ten years ago, no MIS manager would have considered segregated data bases. If a data base had been set up which rivaled the central data base, the manager might have lost his job. The same axiom applies today. The wave of the future is to have a data base upon which all functions are applied.

Software developers have tried to find an alternative to the traditional data base. Today's data base systems, including the so-called relational data bases, grew from a mainframe orientation. Because mainframes are used for structured purposes like inventory control and general ledgers, mainframe software is highly structured. System requirements for such applications can be preplanned and viable for many years.

Unlike the mainframe data base administrator, the personal computer user does not know what task he will be working on next year. He may be faced with a bewildering array of new clients and projects. Data stored today may be useful in a completely different way next year. Because the user does not know what his next project will be, he needs a flexible data base that allows for different record lengths, associations between records and contents of records.

The personal computer user also requires a data base that accepts and manipulates both structured and unstructured data. The product has to be able to capture information at the time of thought. Next week, we will examine in more detail what this software might look like.

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ICON

from page 87

chines," Beek said. "Icons help break down that barrier."

Beek's department has been using Xerox Corp. Star workstations for more than two years to design forms, produce manuals and presentation graphics and maintain a data base of chemical structures.

Wohleber, who has been doing word processing and project tracking at an Apple Computer, Inc. Lisa workstation for about a year, agreed with Beek, noting that concepts such as filing and storage, which were particularly difficult for beginning users to understand, were easier to teach on an icon-based computer.

Although many users have embraced icons with eagerness, some industry watchers have greeted the technology with skepticism.

Edward H. Currie, president of Lifeboat Associates, a New York-based software publishing firm, has reservations about icon-based systems. According to Currie, a system such as Apple's Macintosh has "fairly severe limitations" at present, because it gives users a limited set of tools.

"It's not an environment where you get to choose your own tools; you must work in the context given to you," Currie explained.

"The exciting thing about computers is that they offer virtually infinite capabilities, until restrictions — such as icons — are imposed on them," Currie said. "Then a user only gets as far as the choice of icons offered to them [allows]. Icons represent an attempt to restrict what people do with computers, in the guise of user-friendliness."

According to Currie, icon-based systems are appropriate for novice computer users, but will hinder the work of knowledgeable users.

"As users become more sophisticated, they will become more and more unhappy with icons," Currie predicted. "As they develop self-confidence and more capability with the system, they will want the ability to do new things. And icons as we know them today don't offer that capability."

William Selden, president of Selden & Co., a Calif.-based consulting firm, agreed with Currie, saying that an experienced user would want to bypass the use of icons and return to use of keyboard commands.

But John Tinari, manager of regulatory affairs for Technicon Instruments Corp., a New York company that manufactures wet chemical analyzers, challenged the idea that sophisticated users would want to abandon the use of icons.

"That sounds like something a computer whiz or someone in the MIS department would say," Tinari said. "For normal people, icons save time," he said. "You don't have to remember any arcane code because every operation is represented by a pictorial symbol of what you want to do. It doesn't slow you down. It clears away a lot of the computerese and gobbledygook that goes along with professional workstations."

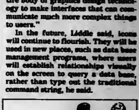
In Tinari's department, where seven Xerox Stars were installed a year ago, the staff is using the systems to produce technical documents. According to Tinari, users have found that the system allows them the chance to do "real work" at the computer, because their minds are not "tied up" in figuring out how to use the system.

In fact, said John Liddle, who headed the Star development project at Xerox in the mid-1970s, that was one of the design goals of the team that developed the Star: to give users a way to manage all the "very complex and very difficult tasks they can't afford to keep in their heads. Icons were not intended to make simple tasks simpler or to help executives reduce their fear of the keyboard," Liddle said. "They were designed to make very complex tasks manageable. They were not intended as some sort of security blanket to make tasks seem artificially simple."

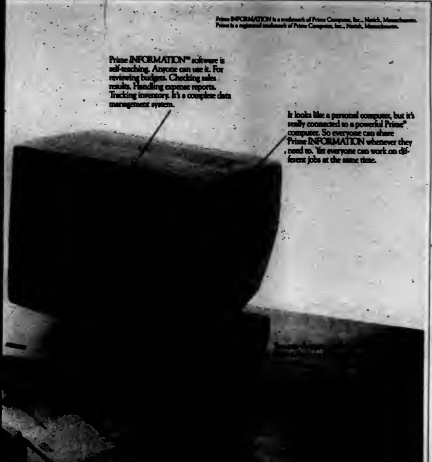
Stuart Card, a member of the research staff in the intelligent systems laboratory in Xerox's Palo Alto Research Center (Parc), agreed with Liddle, pointing out that graphics interfaces such as icons and windows were designed to capitalize on the idea that for humans, "recognition memory is better than recall memory." Icons help users remember more complex ideas by refreshing their memory visually, rather than requiring them to remember an obscure file name or the steps necessary to print a document.

"What has happened in the past few years is that bit-mapped displays have made interactive graphical interfaces possible," Card said. "They have enabled us to use the entire body of graphics design technology to make interfaces that can communicate much more complex things to users."

In the future, Liddle said, icons will continue to flourish. They will be used in new places, such as data base management programs, where users will establish relationships visually on the screen to query a data base, rather than type out the traditional command string, he said.



'I think we have a mouse, too.'



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COMPUTER INDUSTRY

Trilogy to vie with IBM TCM

By Peter Bartolik
CW Staff

CUPERTINO, Calif. — First conceding defeat this past June in its attempt to technologically leapfrog IBM's large-scale processors and more recently effectively giving up on attempts to produce a wafer-scale integrated semiconductor, Trilogy Systems Corp. has lowered its sights, but is still fixated on IBM's turf.

According to Frederick T. White, president of Trilogy, "our strategy is to compete with IBM's thermoconduction module [TCM]."

In an interview shortly after the company announced the suspension of its wafer-scale integration development project and manufacturing operations [CW, Aug. 13], White commented frankly on the problems that befell the once-heralded start-up company founded by Gene Amdahl. Despite the curtailing of the two major prongs of Trilogy's business plan in the past three months, White expressed confidence in the company's ability to carve success out of adversity.

The major problem facing continuation of the wafer-scale project was purely financial, White said. "In order to produce wafer-scale parts, you have to have a wafer-scale manufacturing facility, and that was too expensive," he explained. In the midst of product schedule revision earlier this year, Trilogy noted in a Securities and Exchange Commission filing that it would require "significant additional financing" to continue development of wafer-scale technology and a large-scale processor that was to be based on the wafers. Analysts at the time estimated the company needed an additional $100 million to $200 million to carry it beyond mid-1985.

But there were also major technological problems, White conceded. "The technology, and the rules to use that technology, were changing, probably changing more than we had expected and more than we had hoped."

That changing environment was even more critical in the failure of the simultaneous project to develop an IBM-compatible large-scale processor, a project canceled in June [CW, June 18]. "That technology was a changing target from [the project computer design team's] perspective," White said.

Despite the demoralizing aspects of the failed projects and major employee

See TCM page 108

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Trilogy: Headed for the final act?

Carlton Amdahl jumped off the roller coaster in June when the ride was at one of its lowest points. But his father, Gene Amdahl, seems destined to stay at the helm until the vehicle crashes into the ground.

After first failing to leapfrog IBM with a large-scale computer system based on wafer-scale integrated semiconductors and then failing to develop even the wafer-scale semiconductors, Trilogy Systems Corp. has now changed track to attempt to develop an alternative to IBM's thermoconduction module (TCM).

The many investors in Trilogy must be asking themselves whether they were bankrolling a high-technology product or merely financing Gene Amdahl's never-ending battle against IBM.

With $90 million in cash remaining,

See TRILOGY page 108

■ The new owner of Magnuson Computer Systems, Inc.'s assets plans to develop future-generation processors while trying to avoid the pitfalls that have brought other manufacturers of IBM 4300-compatible equipment to their knees/**100**

■ Speaking of 4300-compatible manufacturers, IPL Systems, Inc. recently reported continuing financial problems/**101**

■ George Tate, founder of Ashton-Tate, died recently of an apparent heart attack at the age of 40/**104**

Switch vendor has history of overcoming adversity

By Peter Bartolik
CW Staff

WILTON, Conn. — To many high-tech firms, a near 80% drop in profits during one year would have a demoralizing impact on future plans. But to A. Henry Morgan, cofounder of T-Bar, Inc., the financial problems of 1982 were merely a glitch on the road to bigger things.

Since it introduced in 1971 what is said to be the computer industry's first A/B switch to enable a data communications system to switch from an on-line front-end processor to a standby unit, T-Bar has released a series of products for the switching, control and testing of data communications.

Until 1982, it experienced steady annual increases of 30% or more in both revenues and profits. That year, revenues tapered off to $29.6 million, from $30.4 million in 1981; profits dipped to $398,000, from $1.9 million in 1981.

Morgan, the firm's chairman and chief executive officer, and cofounder James B. Lambert, the president and chief operating officer, had seen worse days, however.

A. Henry Morgan

CW photo by Peter Bartolik

The company was founded in 1959 as Electronic Controls, Inc. to tap burgeoning defense and aerospace spending. In 1960 it won a bread-and-butter contract to develop an automated landing system for U.S. Navy carrier-based drone helicopters.

By 1964 the contract was essentially obsolete, and the company was in debt to the tune of $400,000 and faced two alternatives: file for protection under Chapter 11 of the Federal Bankruptcy Act or try and pull the company out of the abyss. "We didn't want to go to Chapter 11 at that point in our lives," Morgan recalled. "Between 1964 and 1969, we paid off every penny."

With defense-spending cutbacks announced by President Nixon in 1969, "we decided we wanted to get off the roller coaster," Morgan said. For two years the company "stumbled around," trying to focus on new opportunities in the private sector.

At the end of 1970, the company was sought by Eastern Airlines, Inc., to develop a switch to enable communications from its 180 on-line reservation terminals to be switched to a backup front-end processor.

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See T-BAR page 107

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Global-USI takes position as 4300-compatible vendor

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — The acquisition of Magnuson Computer Systems, Inc.'s manufacturing resources will enable Global-Ultimacc Systems, Inc. (Global-USI) to offer total systems packages of IBM 4300 series-compatible products and avoid the single-product pitfalls that have plagued Magnuson and other plug-compatible vendors, said Global-USI's president.

George J. Pilmanis, president of the majority-owned Storage Technology Corp. (STC) subsidiary, said in a recent interview here, that the acquisition of the Magnuson manufacturing and field engineering resources will result in a viable "plug-compatible alternative to IBM."

Global-USI, formerly known as STC's Ultimacc Business Systems group, will continue selling Magnuson processors under the USX series designation until a soon-to-be-announced next generation product is in production, according to Pilmanis and Gil C. Kellerman Jr., general manager of the Ultimacc Systems subsidiary that will absorb the Magnuson manufacturing resources.

However, Global-USI plans "to do as little design engineering and as little manufacturing in building components as possible," Pilmanis said. Instead, the company will purchase proven CPUs developed by others and combine them with mainly STC peripherals and Global software.

A three-year-old start-up that expects to do $35 million to $40 million in sales this year and earn profits of $2 million to $3 million, STC's subsidiary believes it can carve out a future by selling systems to companies that are not yet willing to follow IBM's direction from the DOS/VSE operating systems environment into the MVS and MVS/XA environment. "We're going after the guys who aren't on the leading edge; but they are the majority," Pilmanis asserted. "But in the future," he added, "we'll be ready with [MVS/XA products] some years out when IBM moves the majority of users along."

Pilmanis said manufacturers of 4300 series plug-compatible processors have failed or are on the verge of failing because "if you just build a CPU, there is not enough money in sales to cover the costs" of development, marketing and support.

Global-USI, he said, provides the Magnuson boxes — now designated the USX series — Global applications software and peripherals that are mainly STC products. Users avoid the need to hire a system integrator.

Despite several times mentioning IPL Systems, Inc., a financially ailing 4300 plug-compatible vendor, Pilmanis said it should not be assumed that IPL central processors will be used in a forthcoming announcement of a follow-on generation to the Magnuson processors.

He also denied the Magnuson acquisition was another attempt by STC to enter the IBM CPU environment following the failure of its attempt to develop a large-scale IBM-compatible processor. STC has two people on Global-USI's board of directors, but is not involved in "day-to-day direction," he said.

Immediate plans call for offering existing Magnuson CPU users financial incentives to trade in peripheral equipment for STC peripherals that Global-USI can obtain at very competitive prices from its parent company. Global software users running applications on IBM 4300 series and other plug-compatible equipment will be encouraged to switch to the USX processors, Pilmanis said.

The company plans to go public soon and has been waiting for a favorable climate on Wall Street, according to Pilmanis. At that point, STC's ownership, which was 66% prior to the Magnuson acquisition, will drop from about 53% to less than 50%. In exchange for the Magnuson assets, the high-tech investment firm of Hambrecht & Quist gained 19% of the stock of Global-USI.

DEC revenues up 31%, profits up 16%

By David Olmos
CW Staff

MAYNARD, Mass. — In a year that began gloomily but ended on an upswing, Digital Equipment Corp. last week reported a 31% jump in revenue and a 16% rise in profit for the fiscal year ended June 30.

DEC's revenues for the year grew to $5.58 billion from $4.27 billion a year earlier. Profit increased to $328.77 million, or $5.73 cents a share, from $283.62 million, or $5 a share, the previous year.

DEC's earnings were helped by tax benefits, but were hurt in the fourth quarter by a write-down of $20.4 million, or 19 cents a share, of its $26 million investment in Trilogy Ltd., a company that abandoned in June its efforts to develop a large-scale IBM-compatible computer.

For the fourth quarter, the nation's second largest computer maker's profit jumped 52% to $130.59 million, or $2.28 a share, compared with $86.02 million, or $1.51 a share, a year ago. Revenue showed a 35% rise to $1.65 billion from $1.23 billion a year earlier.

DEC spokesmen and industry analysts attributed the company's positive quarterly showing to a continued strong economy and a healthy demand for DEC products. One analyst said DEC's equipment sales were better than had been expected, noting continued strong demand for DEC's VAX-11 superminicomputers and VT200 terminals.

"We're very enthusiastic about our business prospects," commented Alfred M. Bertocchi, DEC's vice-president of finance and administration.

In the personal computer area, Mark Steinkrauss, a DEC spokesman, said fourth-quarter shipments, revenues and bookings were the best ever.

One year ago, DEC finished off fiscal 1983 with its first decline in annual earnings in 13 years, and last fall it started off fiscal 1984 with a sharp earnings loss. But analysts agreed that the company, having ridden out that storm, is in a favorable position for the immediate future.

"Digital is extremely well-positioned going into 1985 with its product cycle," said Craig Symons, a financial analyst with the Gartner Group, a Stamford, Conn. market research firm.

In the fourth quarter, DEC reported $4.9 million in tax credits and positive tax-rate adjustments because of lower-than-expected earnings. The company paid $25.6 million in taxes in the same period a year ago.

The company also recorded a 4% negative tax rate for the fourth quarter, which a DEC spokesman attributed primarily to the Trilogy write-down and tax law changes dealing with foreign trade.

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Cullinet, ADR in dispute over who got to China first

Two firms battle over claims of breaking ground in China software market

Even as the 1984 Summer Olympics were proceeding in the spirit of friendly competition, two of the software industry's heaviest hitters were slugging it out earlier this month over who could claim the mantle of premier software supplier to China.

The feud started last month when Cullinet Software, Inc. announced that it had signed an agreement making it the first software company to have distribution rights in China [CW, July 30].

However, Applied Data Research, Inc. (ADR) disputed Cullinet's assertion. ADR claimed it received an export license last year to demonstrate a line of its software products at the Shenyang Blower Works in Shenyang, China. The products were subsequently purchased by the Chinese firm.

Government-sanctioned

Furthermore, ADR indicated that it has a distribution representative in China and that it has been authorized by the Chinese government to sell its products there. "We have a [representative] that has been sanctioned by the government, and we are allowed to sell software in China," said Martin Goetz, president of ADR. "We expect to make sales within the next 90 days."

Cullinet responded by asserting that any distribution agreement with China for software products must be approved by the China Electronics Import and Export Corp., a foreign trade organization within the Chinese Ministry of Electronics Industry. "The [ministry] believes us to be the first and only software company to have been given such approval and on that basis approved the text of our press release," Cullinet said in a prepared statement. The release added that the ministry has never heard of the ADR representative and that it is investigating ADR's claim.

While the feud continues, John N. Maguire, the chairman of Software AG of North America, Inc., offered to put the situation in perspective. "We spent some time over there in 1979 studying the market and teaching courses," Maguire said. "The fact is, there just isn't that much of a market. There are few IBM mainframes in China."

Maguire indicated that the Chinese government is likely to ease distribution barriers as its market grows. "When that happens, most of us [large software vendors] will be there," he added.

IPL reports loss in second quarter

WALTHAM, Mass. — IPL Systems, Inc., a manufacturer of IBM 4300 series-compatible processors, recently reported a second-quarter loss of $2.2 million, or 46 cents per share, compared with a loss of $327,000, or 6 cents per share, in the same quarter a year earlier.

For the first six months of the current fiscal year, IPL reportedly suffered a new loss of $5 million, or $1 per share.

Revenues for the second quarter were $1.03 million, down from revenues of $3.2 million in the same period a year earlier.

The company attributed the losses to looser sales volumes resulting from the unavailability of its latest machine, the Model 4480, during most of the first quarter, and from a realignment of marketing and field service organizations. While initial shipments of the 4480 were made during the latter part of the first quarter, there was resistance from potential customers due to the earlier delays of the product, according to the company.

EDS to offer Hogan system

DALLAS — Hogan Systems, Inc. announced recently that Electronic Data Systems Corp. (EDS), also based here, will provide Hogan's integrated financial system as an additional service to banks subscribing to EDS computer services.

Under the agreement, EDS will have the ability to install the complete Hogan system in EDS information processing centers and plans to offer the service to banks that otherwise might not be able to afford an individual purchase of the Hogan system.

The Hogan system is a series of modules that reportedly provides a complete range of processing and information applications for banks. A bank may use all or part of the system to meet its needs through a service agreement with EDS, according to a spokesman for Hogan.

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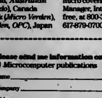

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Corvus Systems reports quarterly revenue decline of $9.3 million

SAN JOSE, Calif. — Corvus Systems, Inc., a vendor of microcomputer local-area networks and disk drives, recently reported a fourth-quarter loss of $9.3 million, or 91 cents per share, resulting in a fiscal-year loss of $10.6 million, or $1.03 per share.

Those results contrasted with fiscal-year 1983 profits of $1.3 million, or 13 cents per share, for the fourth quarter, and $4.3 million, or 45 cents per share, for the fiscal year, a spokesman for the company said.

Revenues declined significantly in the fourth quarter to $10.6 million, compared with $14.5 million for the year-earlier quarter. Annual revenues were $50.5 million, compared with year-earlier revenues of $47.6 million.

Reserves and write-offs assigned to inventories and production expenses involving the company's "slow moving" Concept personal workstation accounted for a large portion of the $8 million in additional losses reported for the quarter, the spokesman said.

The company also said an "unintentional preannouncement" of its Omnidrive mass storage product adversely impacted sales of existing products.

HP finalizes joint venture pact with Chinese electronics unit

PALO ALTO, Calif. — Hewlett-Packard Co. said recently it has reached a final agreement with the China Electronics Import & Export Corp. (CEIEC) to establish a joint venture company to market, service and manufacture HP products in China.

Called China-Hewlett-Packard Co., Ltd., the joint venture effort must still be approved by both the U.S. and Chinese governments. HP has had a distribution agreement with CEIEC since 1981.

Under the agreement, ownership of the company will be equally divided between HP and CEIEC, a foreign trade organization within China's Ministry of Electronic Industry. The Beijing Computer Industrial Corp. will act as a partner with CEIEC to provide assistance on facilities and market development.

The joint venture company, to be headquartered in Beijing, will have a board of directors composed of eight members, with HP and CEIEC each appointing four of them. Its chairman will be one of the four directors appointed by the Chinese group.

Chi-Ning Liu, an HP employee for 17 years, has been named president and general manager of the operation, which initially will be managed by HP.

In another agreement between a U.S. electronics company and China, Gould, Inc. announced earlier this month a licensing agreement with the China National Machinery and Equipment Import and Export Corp., in Beijing. The agreement enables Gould to manufacture and assemble its dedicated industrial computers, called programmable controllers, at a plant in Tianjin, China, for sale in the Chinese market.

Gould will provide workers at the Tianjin factory with technical training, a spokesman for Gould said.

U.S. Robotics files patent suit against Bizcomp

CHICAGO — U.S. Robotics, Inc. said it recently filed suit against Business Computer Corp. (Bizcomp), seeking to invalidate a 1983 patent granted to Business Computer's President Michael D. Eaton.

The suit, filed in the U.S. District Court for the Northern District of Illinois, claims that the patent covers a modem technology already in common use in the industry since the 1960s and, therefore, should not have been granted.

Suit specifics

The suit seeks a declaratory judgment that the patent is invalid or that U.S. Robotics' products do not infringe the patent.

It also seeks to enjoin Bizcomp or Eaton from attempting to enforce the patent against U.S. Robotics or its customers and from engaging in "unfair methods of competition."

The suit further seeks an unspecified amount in damages.

'Common' device

According to a spokesman for U.S. Robotics, a manufacturer of modems, said the suit involves a technology "common" to most smart modems that use a so-called escape signal or automatic disengage sequence to enable a modem user either to give commands to the modem or use the escape signal to send data over telephone lines.

Bizcomp could not be reached for comment on the suit.

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Softerm PC supports concurrent operation of up to 4 communications ports and 3 printer ports through background processing queues. Now you can operate your system to its full potential by simultaneously using your available ports for printing or communications functions. Real-time scheduling eliminates unnecessary pauses and gives maximum throughput for smooth, efficient operation.

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Ashton-Tate cofounder dead at age 40

LOS ANGELES — George Tate, chairman and cofounder of Ashton-Tate, died here Aug. 10 of an apparent heart attack at the age of 40.

"Everyone who knew and worked with George is shocked and deeply saddened," said David Cole, president and chief executive officer of the software publishing firm based in Culver City, Calif.

Tate, who reportedly had no prior history of heart problems, was found unconscious in his office at Ashton-Tate and was officially pronounced dead less than one hour later.

Ashton-Tate was originally a division of Softeam, Inc., a microcomputer software distribution company founded in 1980 by Tate and Hal Lashlee.

Tate and Lashlee also formed Softwaire Centres International, a franchisor of software-only retail operations.

He is survived by his fiancee, Jill Weisman; their daughter, Michelle Nicole Tate; his parents; four sisters; and a brother.

Zilog, Xilinx settle dispute

CAMPBELL, Calif. — Zilog, Inc. earlier this month said it reached an out-of-court settlement of its lawsuit against Xilinx, Inc.

Filed in April, the suit claimed that Xilinx and its three founders, who were former key executives at Zilog, intended to utilize Zilog's trade secrets in the design and manufacture of integrated circuit products.

The companies would not reveal details of the settlement. Zilog said in a statement, however, that "representatives of all parties were satisfied that a fair and proper resolution of the dispute had been achieved." The complaint had charged Xilinx with unfair competition, breach of fiduciary duty, wrongfully attempting to appropriate trade secrets and confidential information and breach of contract.

In April, Xilinx President Bernard V. Vonderschmitt, who left his job as vice-president of Zilog's Components Division to help found the new company, had called the suit "a harassment to keep us from taking [Zilog] employees who are coming to Xilinx."

Sperry unit realigned

BLUE BELL, Pa. — Sperry Corp. recently announced a realignment of the international division of its computer systems unit, creating 11 independent business units designed to recognize "natural markets."

The realignment affects operations in 32 countries and reflects an organizational streamlining by eliminating a level of management and instituting greater autonomy for each unit. Previously, Sperry relied on regional staff organizations for national business activities.

Sperry employs more than 9,000 people in international operations. The realignment is a recognition of cultural and linguistic differences in national markets and will enable the units to utilize local Sperry talent better.

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What's more, our AST-BSC package lets you work in a 3270 BSC environment and still migrate to 3270 SNA/SDLC without hardware upgrades. Another way to save money and aggravation.

Still, there's more. For example, if you have an IBM 3274/3276 Cluster Controller, our coaxial connection hardware is your answer. Once installed (via coax-A), it lets your PC retain its stand-alone processing capabilities and emulate a 3278/9 terminal. With no performance degradation!

You can even use our AST-3780 to support 3780 RJE batch communications. Which gives your PC the ability to operate unattended. And transfer program, data or text files between your PCs and an IBM host at very high speeds.

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Please contact Diana La Muraglia, General Manager, CW International Marketing Services at 800-343-6474. In Massachusetts call 617-879-0700.

Lauffer & Partner

Plessey sets pact

LOUISVILLE, Colo. — Plessey Co. and Storage Technology Corp. said recently that they have reached an agreement in principle for Plessey to purchase the assets of Storage Technology's semiconductor division, known as Microtechnology.

The purchase is subject to a final purchase agreement between the two companies.

The companies would not disclose the purchase price.

The agreement calls for Plessey to continue to operate Microtechnology at its present location here.

Storage Technology is reportedly the largest customer of Microtechnology's semiconductor integrated circuits.

Firm OKs buy

MINNEAPOLIS — Honeywell, Inc. last week announced it has agreed to acquire Digital Datacom, Inc., a California-based vendor of manufacturing systems, for $10 million in cash, to be exchanged for Digital Datacom stock.

Digital Datacom will, if the merger is approved by shareholders as expected, become a separate operating unit of Honeywell and will work in close cooperation with Honeywell's Manufacturing Systems Division. The merger is expected to be completed in late fall.

Honeywell also announced it had agreed to be a second-source supplier of Applied Micro Circuits Corp. Q700 series gate arrays.

NICKELS AND DIMES

Lexidata Corp. announced an adjustment to the company's previously reported third-quarter earnings as a result of a decision to write off Lexidata's investment in Interwork, Inc., which ceased operations July 31.

The write-off results in an additional pretax charge to operations for the third quarter of $979,000, including estimated charges of $106,000 associated with termination of the project.

The restated operating results for the quarter ended June 30 are a loss of $300,000, or 5 cents per share, and for the nine months, the results are a loss of $21,000, or 0 cents per share.

Xidex Corp. reported revenues for the fiscal year ended June 30 of $178.1 million, compared with $112.6 million for the previous year. Profits were $24 million, or $1.06 per share, compared with $15.1 million, or 76 cents per share, for the same period one year ago.

■

Xebec Corp. reported revenues for the third fiscal quarter ended June 30 of $45 million, compared with $16 million in the like period one year ago. Profits were $3.6 million, or 27 cents per share, compared with $1.4 million, or 14 cents per share, in the same period one year ago.

■

Bradford National Corp. reported profits for the six months ended June 30 increased to $2.2 million, or 52 cents per share, from $106,000, or 2 cents per share, for the comparable period of the preceding year.

Revenues, which consist of service fees and interest, amounted to $76.1 million, an increase of $4.7 million, or 7% over the comparable prior-year period.

■

Protocol Computers, Inc. reported third-quarter revenues of $3.7 million, compared with $3.3 million in the comparable period one year ago. Profits were $96,000, or 2 cents per share, compared with $552,000, or 11 cents per share, in the same period a year ago.

■

Wicat Systems, Inc. reported revenues for first fiscal quarter ended July 1 of $6.4 million, down from $8.9 million for the like period one year ago. The firm showed a loss of $1.8 million, or 9 cents per share, compared with a year-earlier profit of $404,000, or 3 cents per share.

■

Communications Satellite Corp. announced profits for the quarter ended June 30 were $11.7 million, or 65 cents per share, compared with $16 million, or 89 cents per share, from the prior year. Revenues were $106.9 million, compared with $109.9 million in the same period one year earlier.

■

TRW, Inc. reported revenues for the quarter ended June 30 of $1.51 billion, compared with $1.41 billion in the like period one year ago. Profits were $68.8 million, or $1.30 per share, compared with $53.2 million, or $1.39 per share, in the same period one year earlier.

In the electronics and space systems segment, sales in the second quarter rose 10% to $717 million, compared with $652 million in the year-ago period. Operating profits climbed 18% to $63.9 million, compared with $54.2 million in 1983's second quarter. Sales of electronic components and credit reporting services continued to move ahead strongly.

■

Computer Memories, Inc. reported revenues for the first quarter of the 1985 fiscal year of $19.1 million, compared with the $9.4 million reported for the same period one year ago. Profits were $948,000, or 9 cents per share, compared with $539,000, or 5 cents per share, one year ago.

■

Data I/O Corp. reported profits for the quarter ended June 30 of $10.4 million, or 19 cents per share, compared with $8.6 million, or 17 cents per share, in the like period one year ago. Revenues were $1.5 mil-

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lion, compared with $1.1 million in the year-earlier period.

■

Electronic Memories and Magnetics Corp. announced profits in the second quarter ended June 30 of $1.3 million, or 21 cents per share, compared with $685,000, or 8 cents per share, in the same period one year earlier. Revenues were $22.8 million, compared with $19.1 million one year ago.

■

Fortune Systems Corp. reported revenues of $20.3 million for the second quarter ended June 30, a 69% increase over $12 million for the like fiscal period a year ago. Profits were $39,000, compared with a loss of $3 million for last year's second quarter.

■

Varian Associates, Inc. announced profits for the third quarter ended June 29 of $15.7 million, or 71 cents per share, compared with $12.6 million, or 58 cents per share, in the like period one year earlier. Revenues were $235 million, up 21% from $195 million in last year's third quarter.

■

Quantum Corp. announced revenues for the first quarter ended June 30 of $25.3 million, compared with $12.4 million in the like period one year ago. Profits were $4.2 million, or 45 cents per share, compared with $2 million, or 22 cents per share, in the comparable period one year earlier.

■

Visual Technology, Inc. reported revenues for the quarter ended June 30 of $13.7 million, compared with $12.2 million in the period one year earlier. Profits were $119,000, or 2 cents per share, decreasing from $1 million, or 27 cents per share for the same period last year.

■

AGS Computers, Inc. reported revenues for the second quarter of $52.9 million, compared with $36.5 million in the comparable period one year ago. Profits were $1.3 million, or 25 cents per share, compared with $1 million, or 24 cents per share, one year earlier.

■

Cybertek Computer Products, Inc. announced profits for the first quarter ended June 30 of $454,000, or 14 cents per share, compared with $194,000, or 6 cents per share, in the comparable period last year. Revenues were $4.7 million, compared with $3.9 million in the same period one year ago.

■

General Datacomm Industries, Inc. announced revenues for the third quarter ended July 1 of $38.3 million, compared with $21.4 million in the same period a year ago. Profits were $2.9 million, or 21 cents per share, compared with $1.1 million, or 6 cents per share, in the same period during 1983.

■

NCA Corp. reported that revenues for the second quarter ended June 30 were $6.1 million, up 48% from $4.1 million in the same period one year ago. Profits were $265,000, or 10 cents per share.

■

Centronics Data Computer Corp. announced revenues for the second quarter of $40.8 million, compared with $44.6 million for the comparable period a year earlier. Net loss for the quarter was $1.8 million, or 16 cents per share, compared with a profit of $437,000, or 4 cents per share, for the same period one year earlier.

T-BAR from page 99

cations," Morgan said. The company changed its name to T-Bar and in 1972 developed a chart showing potential switching and control products at every stage of a data communications flow.

"Those products today are all being made by us, and some are being made by others," according to Morgan.

A steady stream of new products followed, including the Intelligent Matrix Control to enable centralized microprocessor control of T-Bar switches, the Multiple Access Switching System and the Virtual Switch Matrix.

Then in 1982 came the retrenchment. Morgan cited two factors for the flat sales and declining profits: high interest rates that led to deferred purchases and a missed opportunity that was seized upon by upstart competitor Data Switch Corp.

Morgan was gracious in conceding that Data Switch in 1980 realized the new IBM 8080 series presented a need for more communications nodes per switching module and through aggressive advertising won out on some big contracts.

But it was a relatively short period of decline. "By the end of 1982, we came out with our 3690 switch, and that began to reverse the trend," Morgan said.

The rebuilding plan focused on an aggressive new product policy and also on the need for new management blood. "All of our people had grown up with the company," Morgan recalled. "We asked ourselves, 'Do we have the people we need to grow into the bigger company we perceived?' Without exception, we decided to go outside." New vice-presidents were lured away from bigger companies to run engineering, manufacturing and marketing.

Several new products have since been introduced, including a host control software package for large-scale switches, a hardware and software control package based on the IBM Personal Computer and, this past July, a data communications matrix switch for the T1 environment. Revenues are projected to exceed $40 million.

The most far-reaching product, however, is the firm's four-phase Overlord system, a network management system that, as conceived, will someday totally automate performance management, fault management, restoral management and configuration management.

Phase 1 of Overlord, introduced last year, reportedly provides centralized automated control of T-Bar switching equipment located in data networks and data centers and also a data collection and data base management package designed to build a data base of operational intelligence. Phase IV, Morgan said, will result in a heuristic intelligence system that, based on statistical history of user actions, will automatically determine and execute appropriate switching and control actions.

The company has switched from being technology-driven to becoming market-driven, responding to user needs. The Overlord concept, Morgan said, was conceived under the realization that with massive increases in processing power, "things were going to get bigger and more complex."

Now T-Bar hopes to become a $100 million company within four years by providing users with automated tools to manage the vast processing power at their disposal.

Promotional depiction of T-Bar's Overlord, said to be a revolutionary concept for a fully automated network management system.

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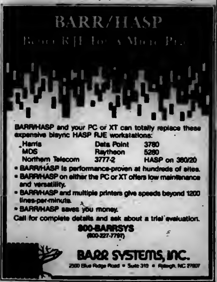

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SYS-ED

TRILOGY

from page 99

plus approximately $70 million worth of capital assets, Trilogy is not yet on the brink of bankruptcy. It has developed circuit design tools that are said to be absolute state-of-the-art, and it has three years of experience designing and connecting highly packed semiconductors.

Yet there are no more wells to go to, and even Trilogy President Frederick T. White acknowledged (see related story page 99) that IBM spent a reported $1 billion and required 10 years to bring its TCM to market.

Despite massive cost cutting and refocusing, at some point Trilogy will still have to come to market with a product. And manufacturing that product is going to require money.

During its short history, Trilogy — incorporated in Bermuda, an offshore tax haven, as Trilogy Ltd. — raised $85 million from venture capitalists; $55 million through a research and development limited partnership; $55 million from a public offering; and an additional $80 million from its equity partners, Sperry Corp. (15%), Digital Equipment Corp. (9%) and CII-Honeywell Bull (8%).

The R&D partnership was effectively made obsolete with the cancellation of the computer development project; DEC and Sperry have written off the major portion of their investments; the publicly traded shares are worth about $1 each; and venture capitalists would undoubtedly want full control in the unlikely event they could be persuaded to donate more funds. The most logical angel would be Sperry, which has several times asserted that wafer-scale integration would be the basis of its next-generation mainframe. But any benefactor would certainly require actual ownership, bring in a new management team and leave Gene Amdahl, at most, as a figurehead. Amdahl, still reportedly bitter after losing control of Amdahl Corp. to Fujitsu Ltd., would seem temperamentally and philosophically disinclined to give up the helm yet again.

The story has all the makings of a Greek tragedy.

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Trilogy posts quarter loss

CUPERTINO, Calif. — Trilogy Ltd. last week reported a loss of $59.2 million, or $1.57 per share, for its second quarter, including a charge of $43 million, or $1.14 per share, related primarily to a write-down for its discontinued development activities and a reserve for related future costs and expenses.

The write-down was a result of the discontinuance of the company's semiconductor manufacturing operations and suspension of its wafer-scale semiconductor integration project (see related story page 99). Losses for the six-month period ended June 24 were $73.7 million, or $1.96 per share, including the charge for discontinued operations.

TCM

from page 99

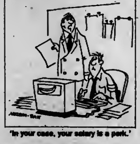
reductions, White said, the company's key people are still very much behind the new business plan. "What we sense is that the evolution of this business plan has come from the key people in the company," he said. "It makes good economic sense."

In White's view, Trilogy retains key technological assets from its failed projects. "With our high-performance technology we developed a large [semiconductor] chip, and more important, we were able to interconnect [circuits on the chip] and integrate it into a system." That knowledge will be used to develop circuits on more conventional semiconductor chips, he said.

"IBM's thermoconduction module consists of very small gate arrays around a package and interconnected. Our goal is to compete with IBM's TCM," White asserted.

Despite its lack of a single product, Trilogy still has $90 million in the bank from its varied funding sources, White noted. "We think $90 million will be sufficient [to fund the company] until we have deliverable products." Affirming that the company definitely plans to offer a product that will compete with TCM, White said the market needs such a product and that financial rewards will accrue to the company that can develop it.

If that plan pays off, wafer-scale integration could again take its place in Trilogy's plans. "Hopefully, we would end up with a twofold approach in the future and develop a more modest-size processor using wafer-scale products," White said.



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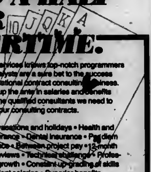

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Prefer working knowledge of a variety of micro-computers, programming experience, knowledge of IBM mainframes, data base management systems and related software. Experience with natural resource data helpful. Game, Fish and Parks headquarters are located in Pierre, the state capital, in an area that offers a rich outdoor lifestyle and quality of life found only in small town America.

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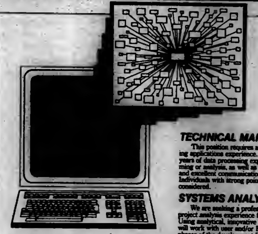

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Excellent opportunities exist in both banking and on-line applications for professionals with at least 3-5 years' extensive COBOL and CICS experience. Other skills must include experience with TSO/SPF, PANVALET and OS/JCL. Demonstrated programming, analysis and debugging skills are essential.

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$20,000 - $28,000

with 2-3 years experience Burroughs programming in a medium system environment. Strong COBOL required and exposure to Forte II and DMS II helpful.

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IMS DB/DC APPLICATIONS PROGRAMMER
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OPERATIONS ANALYST
$22,000 - $28,000

with 2-3 years experience evaluating hardware and software acquisitions, coordinating hardware and software implementations and performing data communications network analyses, cost analyses and work flow studies. Experience with MVS, INFO/MGT., INFO II, IMS DB/DC, JCL, TSO/SPF, PANVALET, UCCI, ACF2, SAS and FOCUS desirable.

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We are seeking Computer Science professionals with advanced degrees (PhD preferred, or experienced MS) to contribute in any of the areas listed above. Interested parties should contact: Shell Development Company, Research Recruitment, P.O. Box 1380, Houston, Texas 77001, or submit inquiries to uucp address... Shell!pnielsen

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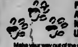

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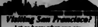

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The successful candidate will participate as a member of the senior development staff engaged in systems planning, procurement, requirements definition/specification, and algorithm development. Must be able to produce written requirements specifications, coordinate subsequent technical feasibility studies and produce justification studies as necessary. The candidate will lead quality assurance efforts including code/standards reviews, in-depth system output evaluation and data evaluation and analysis. Minimum qualifications include a BS (Masters Degree preferred) in a scientific discipline and 5 to 10 years experience in a related field. (Newport position).

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Experience on SEL Concept 32 systems under MPX 2 1-A and/or MPX 3.2 as well as troubleshooting of systems level hardware/ software problems and operating systems maintenance. Requires experience in Gould/SEL Assembly language, diagnostics and MPX internals. Degree preferred and FORTRAN applications are a plus. (Bahamas position).

Applications Programmer/Analysts

Graphics: Application includes real time display on Raster Graphics ONE/25 and ONE/80. Experience in advanced high resolution and/or HTSC Graphics presentation desirable (Newport position)

Real Time Tracking: Analyzes tracking algorithms with respect to accuracy, stability and efficiency. Analyze data associated with anomalous algorithm output and make corrections. Requires familiarity with math modeling, matrix calculus, and structured FORTRAN (Newport position)

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To be responsible for a broad range of engineering functions including Project Engineer, systems configuration, requirements definition, equipment integration, hardware/ software trouble analysis, and some digital design. Position requires either a BSEE degree with 7+ years of experience or an MSEE degree with equivalent experience. Familiarity with INTEL 8086 and/or Gould/SEL computers is a plus. (Newport position)

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- knowledge of PENVAL, Lotus 1-2-3, Super Calc or d Base II a plus.
- successful completion of any Society of Actuary exams would also be helpful.

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Responsibilities will include both maintenance and development of large-scale personnel data base systems (PACS) used to administer defined contribution and defined benefits plans for clients.

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- any microcomputer programming experience helpful.
- knowledge of any of the following would be a plus: IBM VM/CMS, DYL280, SAS, DBMS or project management.

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Computing facilities include the Department's own VAX 11/780 and PDP 11/34 systems. There are plans to triple the total CPU power. In addition, the new 12-MIPS IBM 3081GX system in the Computer Centre, is heavily used by the Department. Computing laboratories that are currently being set up include Logic Lab, Micro Lab, Data Communication and Computer Networking Lab. Current research interests include: database management, local area networks, software engineering, microcomputer applications, office automation and theoretical computer science. Other areas are being developed.

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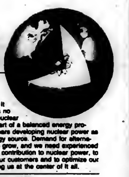

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If you are a results oriented, high integrity business person seeking accomplishment within a participative management company, you are encouraged to forward a resume or letter describing your information resources background and management progression to: David Pasternak, Vice President, Human Resources, QUALITY STORES INC., P.O. Box 5200, North Muskegon, MI 49445. An Equal Opportunity Employer M/F/H.

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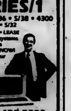

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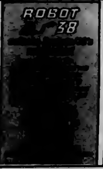

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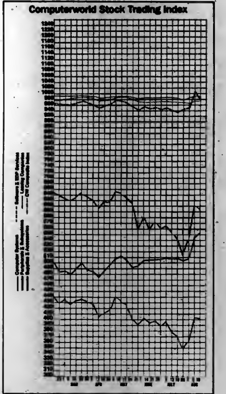

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ADVERTISERS INDEX

ADR 3
Agile 46
Anadex 23
AST Research 104
AT&T Information Systems 31-33,50-51

BDS 9
B I Moyle Associates, Inc. 98
Barr Systems Inc. 107
Business Marketing 13

C. Itoh/Digital Pro 42
Candle Corporation 51
CGA Software 88
Chicago Soft ID/2
Codercard 75
Collier-Jackson 84
Comdesign 88
Computer Management 19
Computer Traders 107
Computer Technology Group ID/13
Coredale 98
CEWTE 84
CS Computer Systems 98
Cullinet 35
CW Buyer's Guide 108
CWCI 101
CW Extra 98
CW IMS 88,106
CW Subscription 84

D&B Computing Services 91
Data Base Management 63
Data Rentals-Sales 77
Dataproducts 63
DEC/TPG 72-73
Deltak, Inc. 12
Digital Controls Corp. ID/9
Digital Engineering 64-65
Dorian Products ID/12
DSS Development 67
Duquesne Systems Inc. 61
Dysan 47

Eastman Kodak Co. ID/19
EDP Security ID/9
Epson America ID/21
Execucom Systems Corp. 44-45

Four Phase Systems 48-49
Fusion Products 37

General Electric 66-67
Gould Software 26-27

Hayes Microcomputer 56-57
Hewlett-Packard ID/22,30

IBM 100
IDP 5
Infodata Systems 71
Innovative Software 98

J.W.Lampl, Inc. 98
Lawson Associates 84
Levi, Ray & Shoup 92
Local Data ID/10

Mathematica 19
McCormack & Dodge 108
Memorex 10-11
Michaels, Ross & Cole 74
MicroFrame 84
Micro-Term 79
Multi Solutions 108

NCR-Customer Service 15
NameLab Inc. 108
Nestar 88
Northern Telecom ID/1-ID/8

Paradyne 74
Philon Inc. 88
Pinnacle & Associates 45
Plycom Services 104
Polaris 78
Prime Computer 96-97
Professional Computer Research 78

Radio Shack ID/6
Rolm Corp. 68-69

SAS Institute ID/14-ID/15
I.P. Sharp Associates 70
Signal Technology Inc. 54,59
Softool 46
Softronics 108
Software A G 39,43
Software Corporation of America 88
Software House 15
Software Results 108
Southern CA Delivery Service 79
SPSS 98
Storage Technology ID/16
Syncsort 7
Sysed 107
Systems Center 92-93

Tandem Computers 20-21
Technology Transfer ID/12
Teletype 88
Telex 98
Tone Software 84
Trax Softworks, Inc. ID/20

Unilogic, Ltd. ID/10

Verdix 14
Visual Technology 93
VM Software, Inc. 80

Wyse 41

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